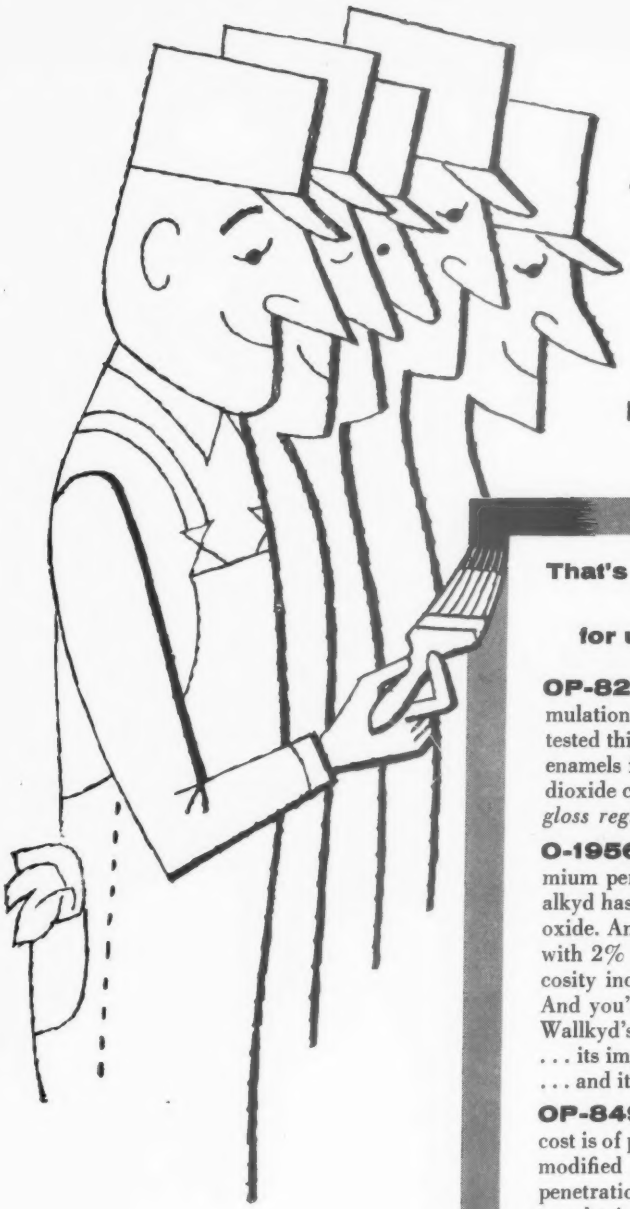
PAINT and VARNISH Production

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHE

FEBRUARY
1956



"You don't have to **count noses** to know there's a growing market for odorless paints!"

That's why RCI has developed *three new alkyd resins* especially for use with odorless solvents.

OP-825-70 BECKOSOL in odorless enamel formulations gives outstanding gloss retention. We have tested this long oil pure alkyd in typical architectural white enamels formulated with 3% zinc oxide based on titanium dioxide content. *After nine months interior exposure, their gloss registers above 90 on the Gardner 60° Glossmeter.*

O-1956-35 WALLKYD is recommended for "premium performance" odorless flat wall vehicles. This pure alkyd has *unusual stability properties* with or without zinc oxide. An experimental flat paint formulated at 65% PVC with 2% zinc oxide based on total pigment showed a viscosity increase of only 8 Krebs Units after three months. And you're bound to be favorably impressed by this new Wallkyd's exceptional enamel hold-out at wide PVC ranges . . . its improved brushing qualities . . . its non-penetration . . . and its sheen uniformity.

OP-849-40 WALLKYD has advantages where cost is of prime importance to the formulator. This low-cost modified alkyd assures excellent brushability and non-penetration, along with good washability. It's worth remembering, too, that flat vehicles made with OP-849-40 can be used with the new water-phase or solvent-phase tinting colors without reduction in viscosity, or any need for adding aromatic thinners to promote compatibility.

Perhaps one of these new RCI alkyds can help *you* develop a superior finish or improve an existing formula. Write RCI for full information and working samples.

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REICHHOLD CHEMICALS, INC., RCI BUILDING, WHITE PLAINS, N. Y.

Severe mottling resulted when this asbestos-cement shingled house was painted with two coats of an oil-based, exterior finish.

Complete color uniformity resulted when the same house was painted with two coats of the new, nonmottling formulation based on PLIOLITE S-5.

Pictures of a problem being whipped!

Shown above is a practical demonstration of the results of several years' study by Goodyear of the causes and cure of flat paints mottling on masonry.

Mottling is caused by variation in binder availability brought about by differential absorption. Uniform color is achieved, when pigment binder demand is fully satisfied. Binder demand is a function of pigment particle size, shape and distribution plus the degree of dispersion, moisture, flocculation and the type of binder involved.

Goodyear paint chemists recently completed an extensive study of many types and levels of pigmentation and their dispersion in PLIOLITE S-5—first and finest of the styrene copolymers. The result is a new series of formulations which, extensive tests indicate, *do not mottle,* exhibit all the advantages of paints made with PLIOLITE S-5 and *are extremely low in cost.*

Full details on new, nonmottling, low cost, long-lasting paints based on PLIOLITE S-5 are yours in the latest *Tech Book Bulletin.* Write for it to:

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(Established in 1910 as The Paint and Varnish Record)

VOL. 46 FEBRUARY, 1956 NO. 2

NEXT ISSUE

Chlorinated rubber based paints and their use in corrosive environments will be featured in the March issue. The article covers such important factors as film properties, film thickness, metal preparation, and cost data.

FEATURES

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Home Improvement Year

THE Housing and Home Finance Agency has proclaimed 1956 as "Home Improvement Year."

Speaking for President Eisenhower, Albert M. Cole, Administrator of the agency, said:—

"I urge the American people to join with the President and the great forces of private enterprise in a concerted effort to attain nationwide improvement of our country's homes."

Working through local Chambers of Commerce, the purpose behind this national undertaking is to stimulate local groups to make necessary repairs and improvements to dwellings by encouraging dealers, lenders, contractors, architects and home owners to work together towards rehabilitating homes that can be saved—thus relieving the pressure of the present housing shortage and at the same time materially increasing the value of the nation's property wealth.

In his New Year's message to members of the NPVLA, President Joseph F. Battley emphasized the fact that paint products have failed to keep pace with related construction materials in volume increase.

In order to capture a greater share of the consumer market in 1956 (a year of expected high activity), President Battley urges the industry to adopt a hard-hitting selling campaign in every potential use of paints.

He further pointed out that millions of homes, plants, institutions, and stores need painting, and here was an attractive market for the paint industry which could mean a considerable increase in the use of coating materials.

In line with "Home Improvement Year" sponsored by the Housing and Home Finance Agency, the paint industry through a vigorous selling job as advocated by President Battley can benefit immeasurably by such a campaign in view of the fact that one out of every ten American Homes is a slum, and four of every ten need repair and improvement, and the rest need maintenance.

Alkyds for Exterior Use?

IN DISCUSSING new developments in alkyd resins at the Glycerine Division Session of the recent convention of the Association of American Soap and Glycerine Producers, Oscar P. Muller, asst., trade sales manager of National Lead Company pointed out that while alkyd resins have penetrated into practically all phases of the paint industry, little is used today in exterior house paints. Mr. Muller attributes this situation to the generally slow progress which has taken place in house paint research and also to early failures, a result of lack of understanding of the problems involved.

With research being stepped up in this particular field, preliminary results seem most encouraging.

In this connection Mr. Muller mentioned the possible uses of isophthalic acid alkyds in exterior wood application, since the uniform structure of these alkyds and their higher solution viscosities could permit the use of more fatty oil modifier in the formulations. Mr. Muller further asserts that while maintaining the desirable speed of initial dry, it should be feasible to provide the necessary flexibility retention and gradual film breakdown characteristics, which are considered two important features for the successful development of exterior wood protective coatings.

Another attempt which shows promise in developing blister and stain proof exterior house is utilizing a combination of a standard long oil alkyd with chlorinated paraffin resin as the major portion of the vehicle.

Undoubtedly there are similar investigations being conducted to solve exterior wood protection through alkyd-base paints. This points up the vigorous attempt on the part of alkyd producers to capture their share of the exterior coating market which has annual estimated consumption of some 60 million gallons.

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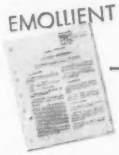

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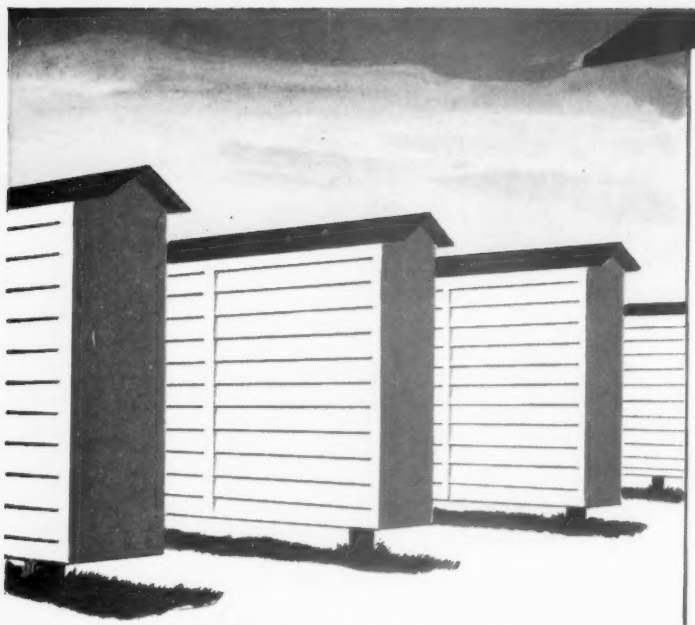

Every day for 36 years the records have been taken at National Lead's Experimental Test Station, Sayville, L. I. . . . the weather, hour by hour . . . solar radiation . . . the chemistry of the air . . . the condition of thousands on thousands of paint samples. Today, on 2½ miles of test fence, more than 30,000 exposure tests are active.

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In paint after paint, Dutch Boy "45X" steps up key properties underlying *uniform* performance . . . stops complaints *before* they start.

Cost actually goes down

In "45X" proportionately larger amounts of lead are available. That's because the reactive portion of each pigment particle is concentrated at the surface.

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offers proved protection for outdoor aluminum surfaces

Users of aluminum know well its tendency to spot, pit and dull in outdoor use. Now, prolonged testing conducted with a leading user of aluminum trailer trucks shows that lacquers made with Eastman Half-Second Butyrate can furnish long-lasting protection for aluminum. Note how the Butyrate-protected side (left) of this aluminum trailer truck body remains clear, unspotted and unpitted after 16 months and 128,000 miles of grueling road use. Contrast this with the dull, spotted and pitted untreated surface (right).

Lacquer films made with Eastman Half-Second Butyrate retain their toughness and initial low color for long periods, indoors and out. These films do not break down under the damaging rays of the sun. Their adhesion to aluminum is outstanding. Note the two scarred areas on the ribs at the extreme left of the above photo. Though bare metal was exposed here, there was absolutely no peeling of the remaining film surrounding this damaged area.

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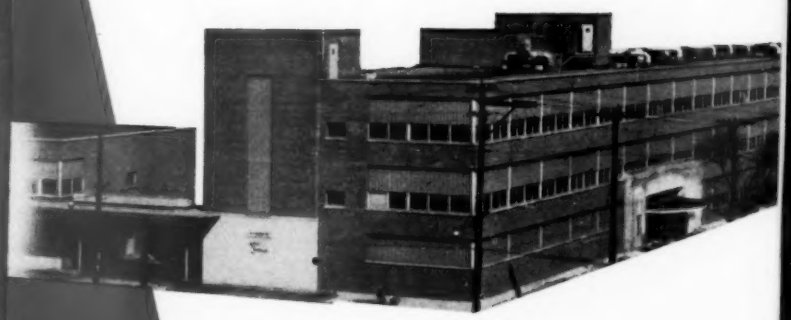

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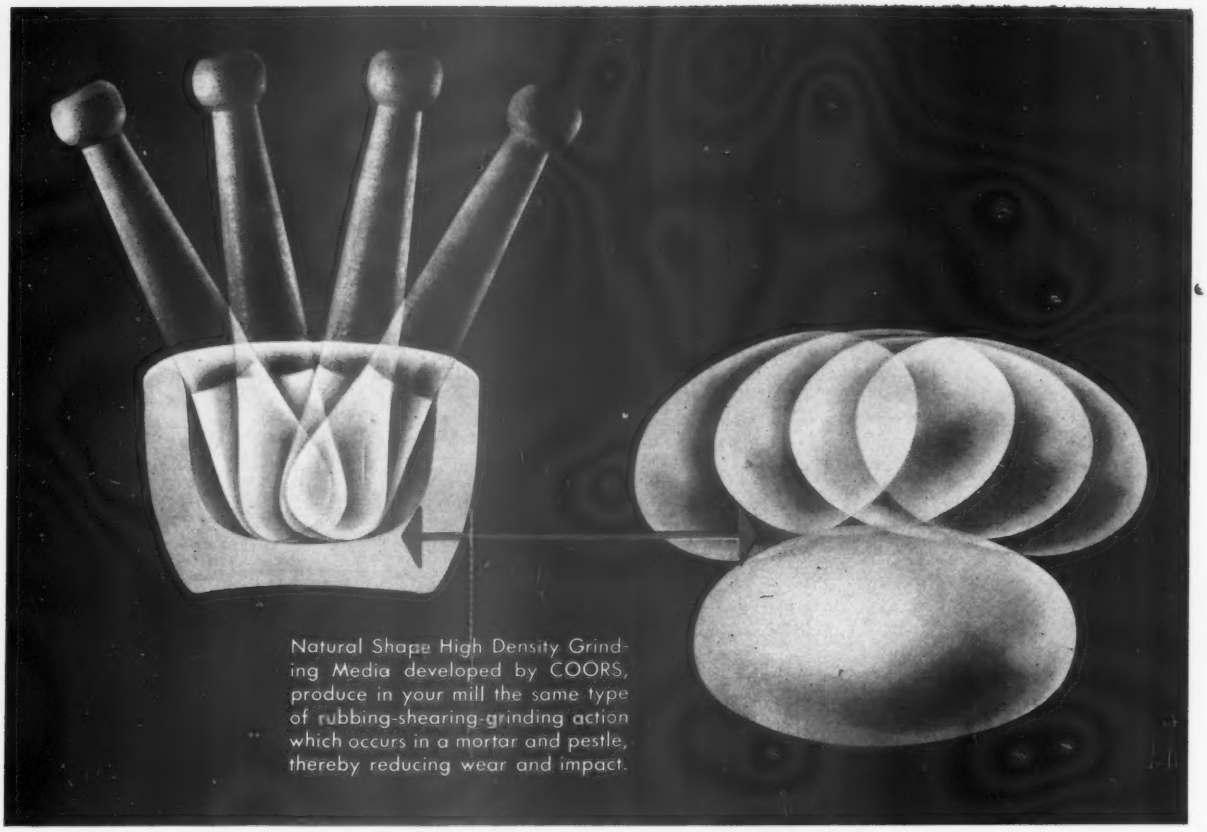

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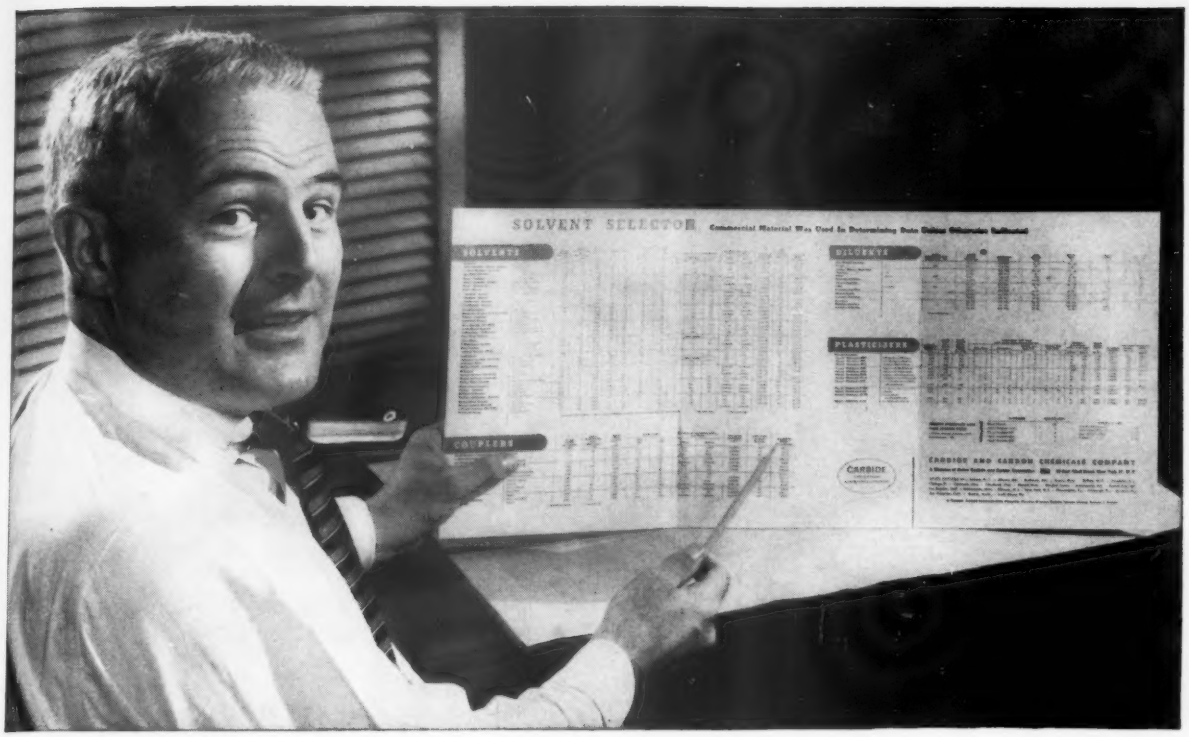

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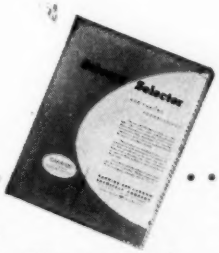

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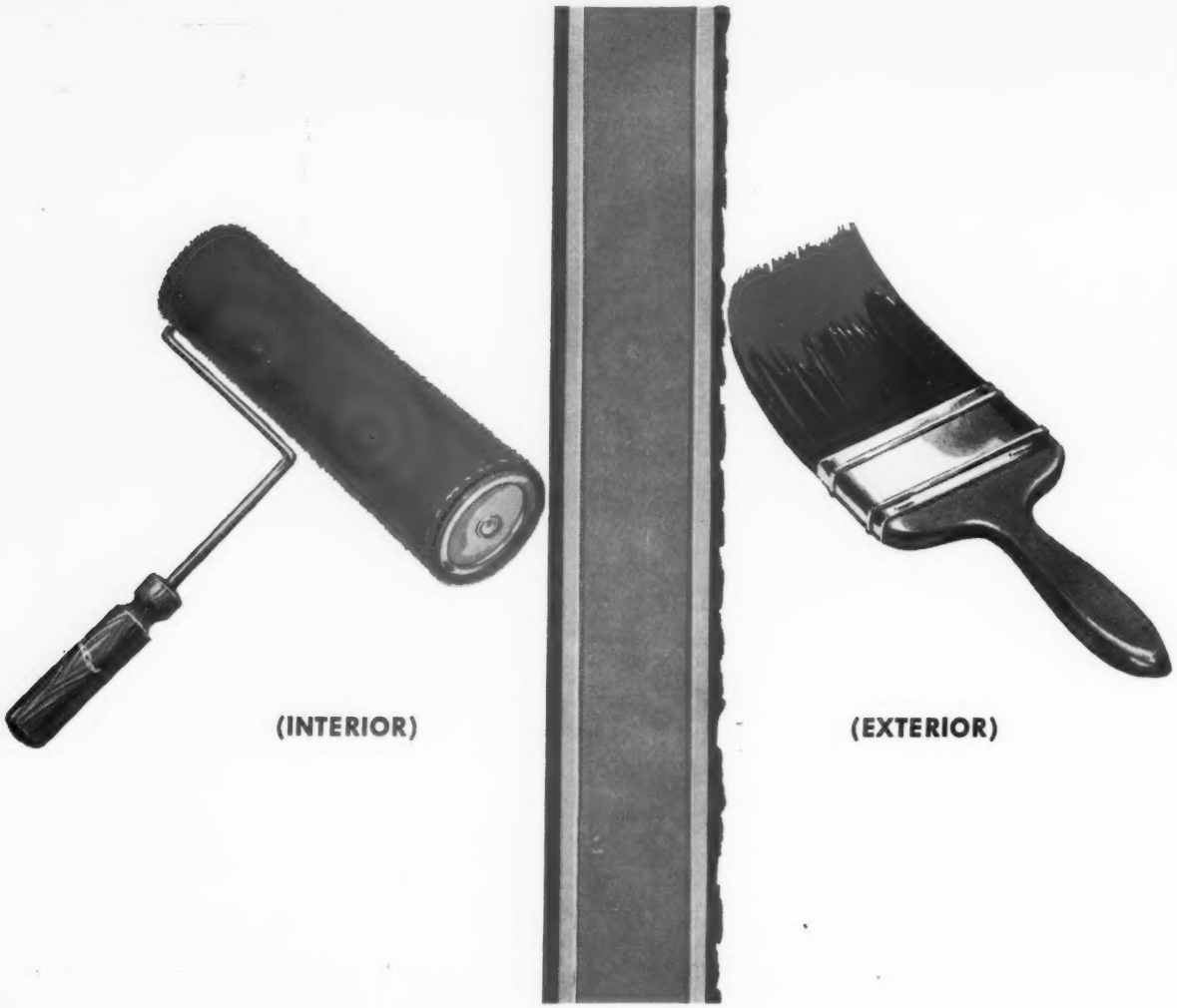

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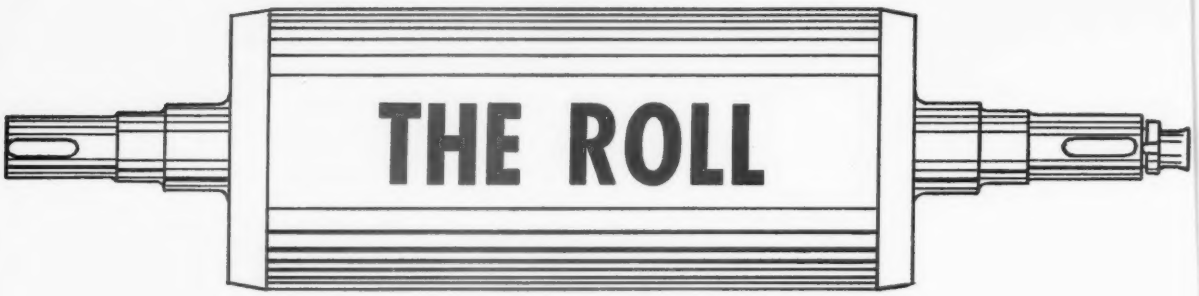

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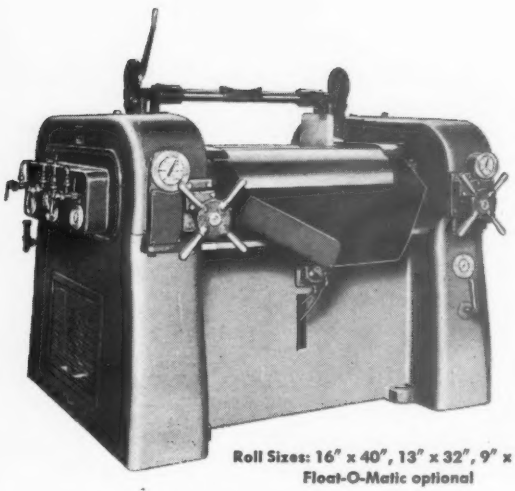

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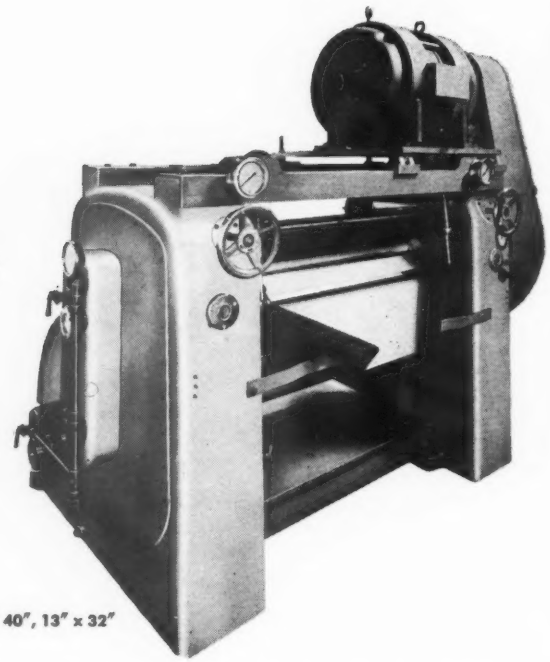

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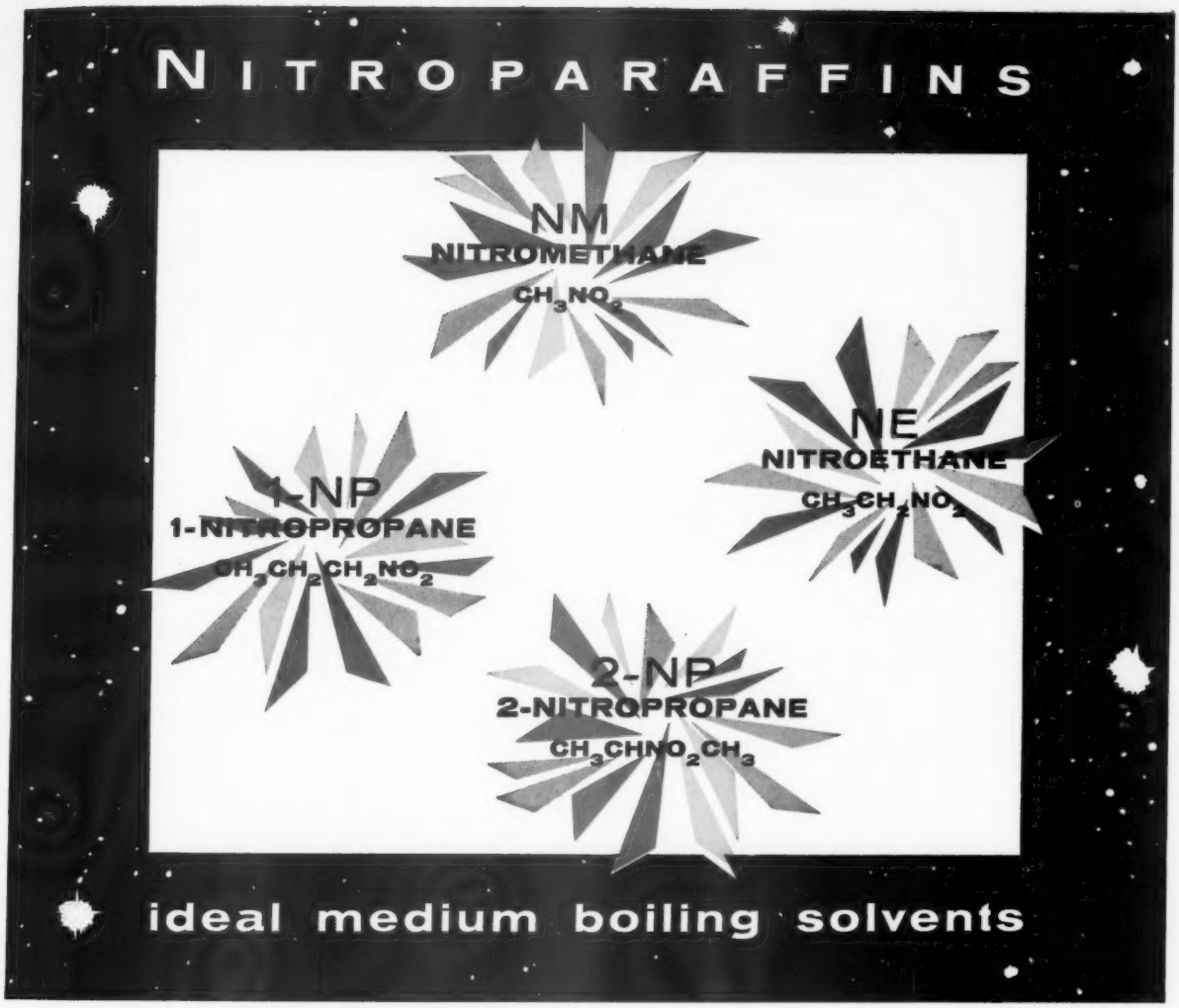

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AMP (2-Amino-2-methyl-1-propanol)
NB (2-Nitro-1-butanol)
NEPD (2-Nitro-2-ethyl-1, 3-propanediol)
NMPD (2-Nitro-2-methyl-1, 3-propanediol)
NMP (2-Nitro-2-methyl-1-propanol)
TRIS AMINO (Tris [hydroxymethyl] aminomethane)
TRIS NITRO (Tris [hydroxymethyl] nitromethane)
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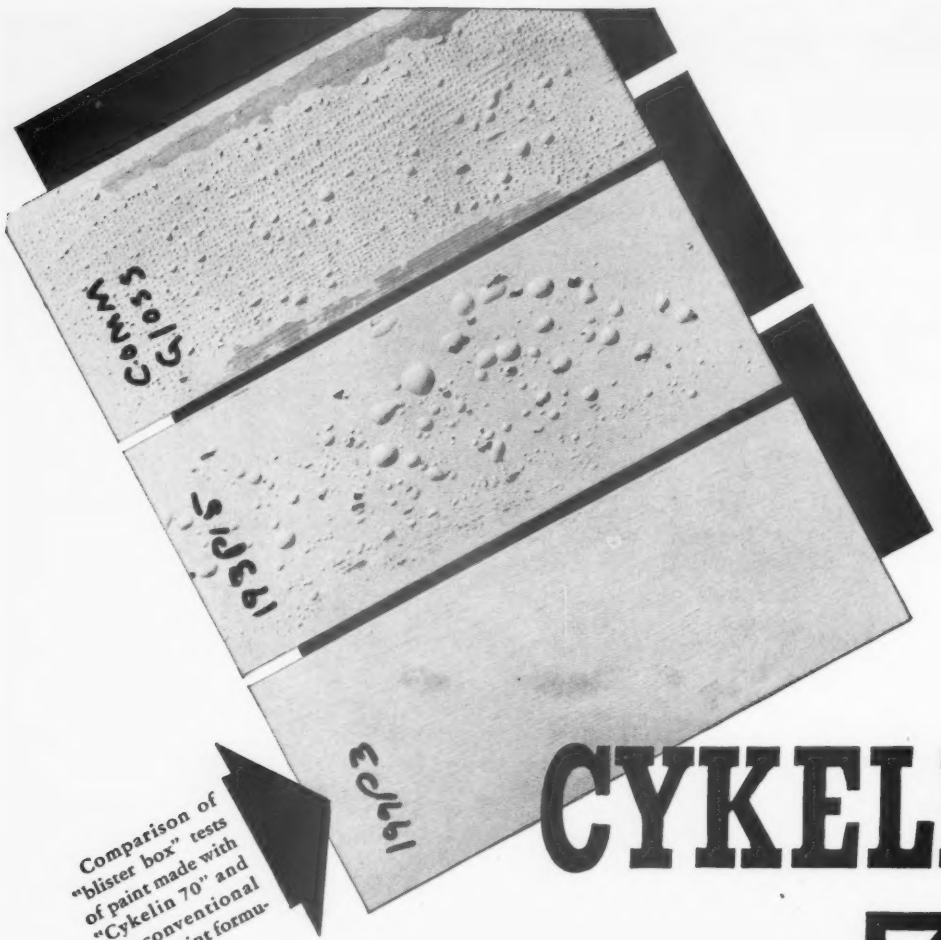

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Neo-Fat 127	125-128	196-203	27 Max.	4 Gard. Max.	*
Neo-Fat 132	130-133	196-203	27 Max.	3 Gard. Max.	*
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A FANCY FORMULA FOR FINER FINISHES

The High Film Build Thinner is briefly reviewed, the advantages discussed, and certain techniques applicable to its use, described. Typical formulae are furnished for use with lacquers and enamels.

By Wardley D. McMaster
Ass't. Head, Chemistry Dept.,
Research Laboratories Div.
General Motors Corp.

PRACTICALLY every paint product is fifty percent thinner. Thinner, while it is useful, is the least costly portion, yet still worthy of consideration. The High Film Build Thinner principle was developed over five years ago. It is applicable to lacquer, enamel and other paint formulations. Experience in the use of the principle over several years led to a better understanding of its use, and the development of formulae for air-drying lacquer, and for enamels.

Principle

Briefly, the principle calls for a thinner formulation wherein about 70% by volume distills below 95° C., relatively little in the middle range, and about 25% in the range beyond the pre-1940 maximum. This is Formula G, Figure 1 and Figure 2.* A typical formula of the early thirties is illustrated by Formula A. Formula B is the Research Formula used in the middle thirties. All are lacquer thinner formulations. The low boiling fractions are volatilized rapidly after leaving the spray gun, having served their purpose by reducing the viscosity and enabling thorough atomization by the spray gun. Loss of these volatiles leaves the material with a much higher viscosity, so that there is little tendency to sag as it lies on a vertical surface. Furthermore, its slow drying permits maximum lev-

ITEMS	Formulae, % by volume		
	A	B	G
Ethyl Alcohol	10	10	10
Ethyl Acetate	10	-	-
Butyl Alcohol	10	5	-
Butyl Acetate	30	15	-
Toluene	50	40	-
Amyl Alcohol	-	5	-
Amyl Acetate	-	5	-
Toluene Substitute	-	20	-
Acetone	-	-	20
Diacetone	-	-	15
Butyl Cellosolve	-	-	10
Naphtha (60°-90°C)	-	-	45
	100	100	100

Figure 1. Conventional and Hi-build thinners

*Formula G has been successfully used in production during the past two years.

This article was prepared from a presentation to the Industrial Product Finishes Technical Sub-Committee of the National Paint, Varnish, and Lacquer Association, Atlantic City, May 17, 1955
Based upon an original publication entitled "A Study of Lacquer Thinner" appearing in the "*Official Digest*", April 1952, Federation of Paint and Varnish Production Clubs.

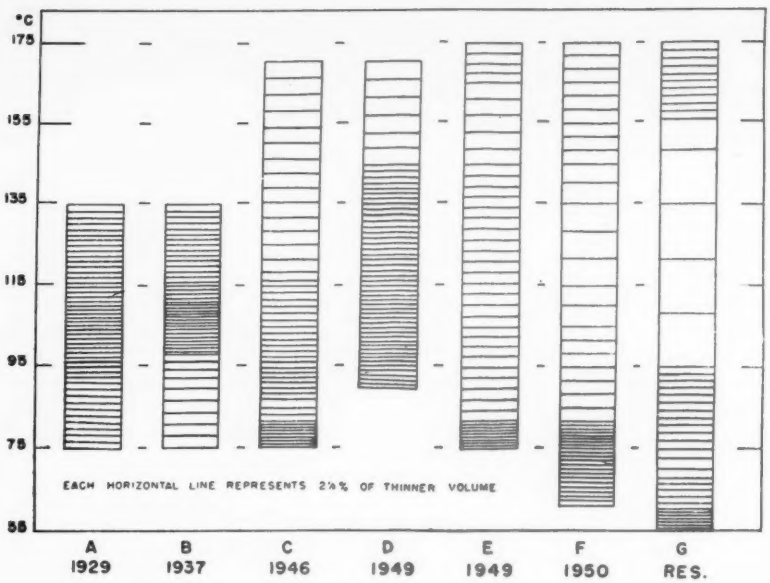


Figure 2. Thinner evolution—Concentration against temperature

eling of the film, and its high solvency promotes the optimum luster and clarity of film.

Advantages

Production experience has more than justified expectations wherever production facilities were planned or could be corrected to take advantage of the new thinner.

1. There was little or no dry spray.
2. There was no trouble with overspray.
3. There were no sags.
4. There was no "orange peel."
5. The luster was improved slightly.
6. The color clarity, particularly in the case of blacks, was improved.
7. Two to three mils of dry film could be applied in one coat, if desired.
8. There was no "dulling back", even if the film were not thoroughly dried.
9. Such sanding and polishing operations as were required could be performed without difficulty.
10. Irridescents were easier to apply without float or clouding.
11. Pinholing occurred, but usually not much worse than with conventional thinners when equally heavy films were applied. This could be eliminated by proper detail formulation, or other means.
12. A higher baking temperature was noted as desireable, and a repair baking temperature not as high as the first, lest pinholing result.

The techniques of application of this thinner have not always received the attention deserved. The first requirement is a slower swinging of the spray gun on the part of the operator. He must abandon his wide, rapid and haphazard motions and proceed with a slow back and forth motion, reducing the strokes to about 1/3. This eliminates about 3/4 of the waste due to overspray. The gun should be held 10 to 14 inches from the work, and perpendicular to it. This procedure results in:

1. Sanding of material.
2. Greater uniformity of film thickness.
3. A wetter, better leveling film.
4. Reduction of overspray.

A film that will dry to a thickness greater than 1 mil must be laid down in order to be sure of reasonable flow-out. The desireable thicker films show a definite tendency toward pinholing when baked rapidly. This may be due to trapped air or to trapped solvent. The simplest control is the addition of more high boiling solvent, which keeps the film open. Up to the limit of sag development, medium boiling constituents may be added to the formulation, instead of high boilers, thus eliminating part of the value of the theory.

Even the high boiling materials may cause popping if retained in the film after drying too short a time, and subsequent re-heating to too high a temperature during repair operations. The temperature, relative humidity and the rate of flow of the make-up air of the spray booth, have a direct bearing on the tendency to pinhole.

Pinholing

The mechanism of pinholing due to air entrapment has been demonstrated[1] as due to excessive air pressures, resulting in too high a velocity of paint between gun and work. Figure 3 suggests how this develops. It is assumed that spherical drops of paint leave the

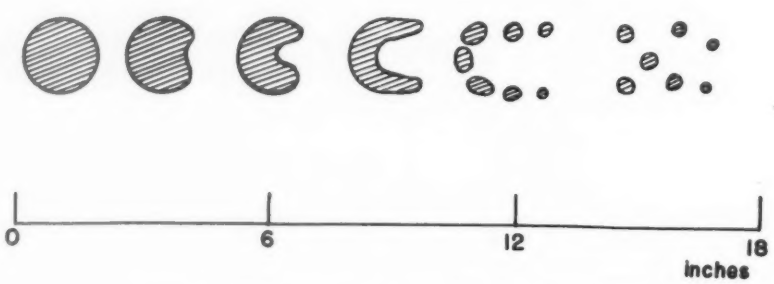


Figure 3. Development of a droplet from a spray gun

spray gun at a high velocity, meet with air resistance, form first a flat front, then a cupped front trapping air, but later disintegrating. It has been determined that if the spray gun is held less than 10 inches from the work, Figure 4, the lacquer cups carry air into the film, but if more than 14 inches, this is not likely to happen. If the required atomizing pressure be reduced by a reduction in viscosity through the replacement of the naphtha by acetone, or by using a greater volume of thinner, the cupping tendency may be reduced appreciably. Other conditions may affect pinholing, such as the time and temperature prevailing between the spray booth and the oven. A short time tends to promote pinholing, as does too rapid a rise in temperature, or excessive air circulation. Films greater than 2½ mils in dry thickness are particularly susceptible to pinholing due to solvent trapping, but films in excess of 1¾ mils of lacquer or enamel are of questionable value, assuming proper preparation of the base metal and the use of at least 1 mil of sanded undercoat.

It should be clear from this discussion that a study of the application of the High Film Build thinner must be made in a production operation by competent engineers.

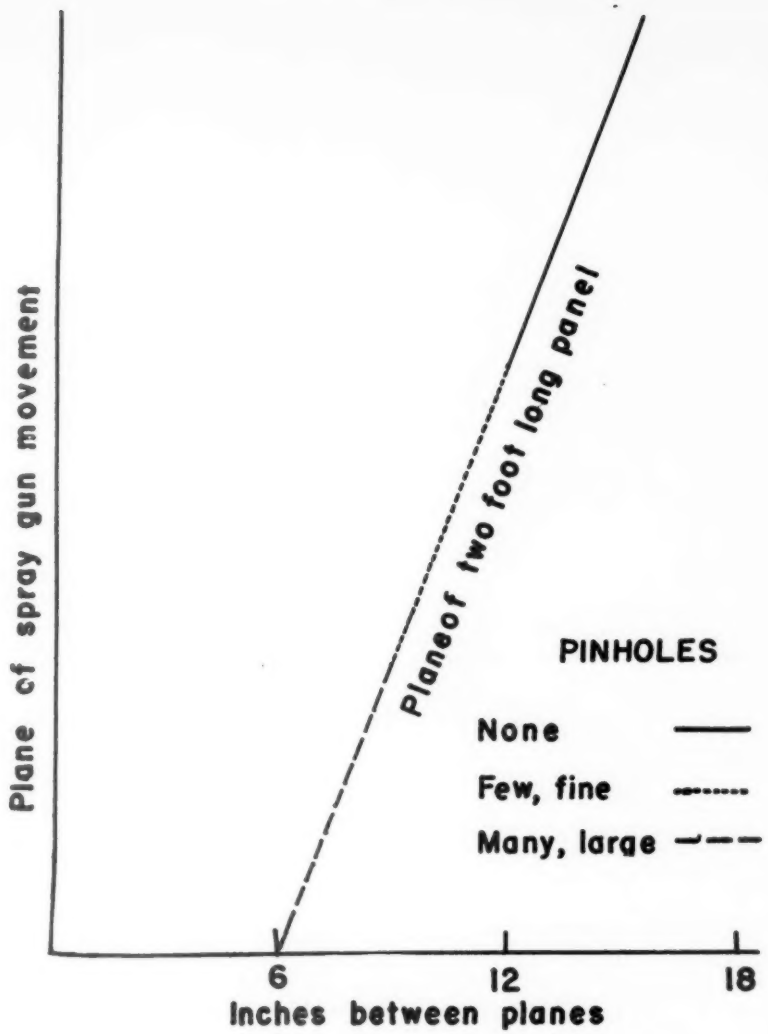


Figure 4. Effect of spray-gun to work distance on pinholes

ITEMS	Formulae, % by volume fast	slow
Acetone	17	14
Isopropyl Alcohol	10	10
Cellosolve Acetate	15	15
Toluene	15	15
Aliphatic Naphtha 60-90 C	43	40
Butyl Cellosolve	-	6
	100	100

Figure 5. Formulae for air-drying thinners

New Formula Needed

The established success of the theory in connection with lacquer that was force-dried, led to a demand for a formula that would air dry quickly, and still offer some of the benefits. Naturally, the permissible time to dry to handle or pack, governs the degree of flow-out obtainable, but the film build is not necessarily limited. Cellosolve Acetate becomes the major high boiling constituent. Figure 5 shows formulae for fast and slow drying thinners for air drying lacquer. Such formulations should be applicable to furniture finishing, both for sealer-fillers of the nitrocellulose type, and for top coats.

(*Turn to page 76*)

EFFECT OF GAMMA RADIATION ON THE STRESS-STRAIN PROPERTIES OF UNPIGMENTED SOYA ALKYD RESIN WET FILMS

By
L. L. Carrick
George C. Sun
University of Michigan
Ann Arbor, Mich.

THE EVALUATION of properties of alkyd resin films subjected to gamma irradiation is in no way complete. The effect of gamma irradiation on attached non-pigmented baked soya-alkyd dry films has been investigated by Carrick, Banchero and Permoda (1). The irradiation of attached unpigmented soya-alkyd baked dry films increased the breaking strength of the films from 96.8 to 117.3 Kg/cm^2; the toughness area from 35.8 to 39.3 (the area under the stress elongation curve is a measure of the work required to rupture the film and is expressed as toughness (2); and decreased the breaking elongation from 42.3% to 38.1%. In general, the data obtained from irradiation of attached soya-alkyd baked dry films exhibited a higher breaking strength at the point of rupture, increased the toughness, and reduced the per cent of breaking elongation. Additional aging of the irradiated films indicated that the irradiated-induced reactions were continued after cessation of irradiation in accord with the work of Sisman and Bopp (3) as reported in their study of plastics. Since oxidation is a general effect of irradiation whenever free or combined oxygen is available to the system, Burr and Garrison (4) have noted that the breaking strength of plastics is essentially unaffected until the irradiation exceeds 10^7 to 10^8 roentgens. This is further emphasized by Figure 1 which is reproduced from the study of Carrick, Banchero and Permoda (1).

This investigation was directed to the evaluation of the effect of gamma irradiation on the stress-strain properties of soybean-alkyd

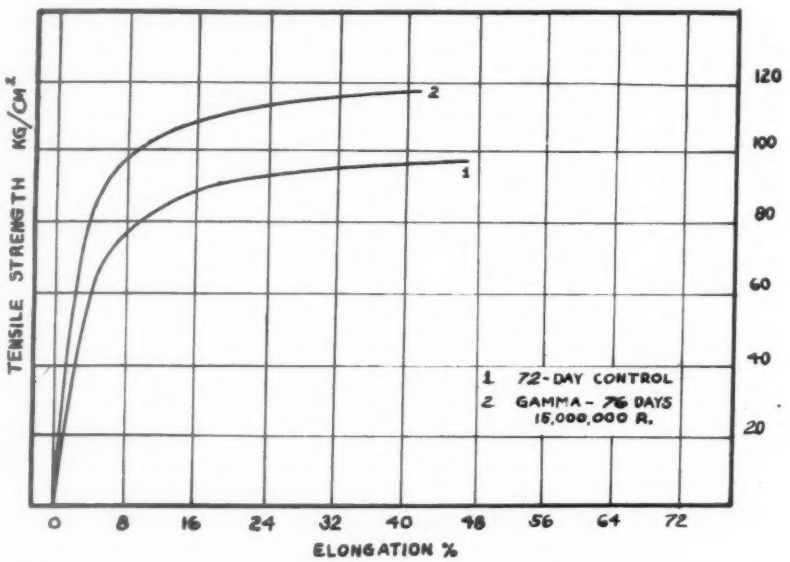


Figure 1. Soya-alkyd resin films—force dried 35 minutes at 295° F; Drier: 0.02% Mn—0.06% Zn based on non-volatile—control aged at 50% RH and 77° F.

films which had been irradiated while in the undried state.

Experimental

The soya-alkyd resin solution of medium oil length employed was from the same soya-alkyd lot as that used by Carrick et al (1). The characteristics of the soya-alkyd solution were:

Phthalic anhydride based on the non-volatile	42%
Soya oil based on the non-volatile	41%
Viscosity at 50% non-volatile in aromatic naphtha	Z_1-Z_3

Driers were added to the soya-alkyd resin solution just prior to film casting in amounts equal to 0.02% Mn and 0.06% Zn metal based on the non-volatile content of the soya-alkyd resin solution.

All the films were cast on 4-cross tin-coated steel panels by an electrically driven draw-down apparatus and a film applicator in order to control the deposited film thickness. The dry film thickness was approximately one mil, which was measured with an Ames gage on the stripped film.

The panels were cleaned in C. P. acetone to remove adhering grease. After cleaning, the panels were kept in a desicator over anhydrous calcium chloride until they were coated with the soya-alkyd resin solution.

The wet films, within 30 minutes after casting, were exposed to gamma irradiation from a 10000 Curie Co^{60} radiation source. The wet panels were held in a horizontal position by a wooden rack placed at a distance of two inches directly above the well of the radiation source. The panels exposed in this manner had a uniform irradiation over a three inch radius of the panel, where the dosage rate was 80000 roentgen per hour.

In Figure 2 are given dosage rates as a function of distance of exposure from the source. The panels were irradiated for definite periods, Table I. The panels, upon removal from the irradiation chamber, were baked for 35 minutes at 295° F in an electric oven through which air was circulated by a motor driven fan. The baking was followed by an aging period at a constant temperature of 77° F and

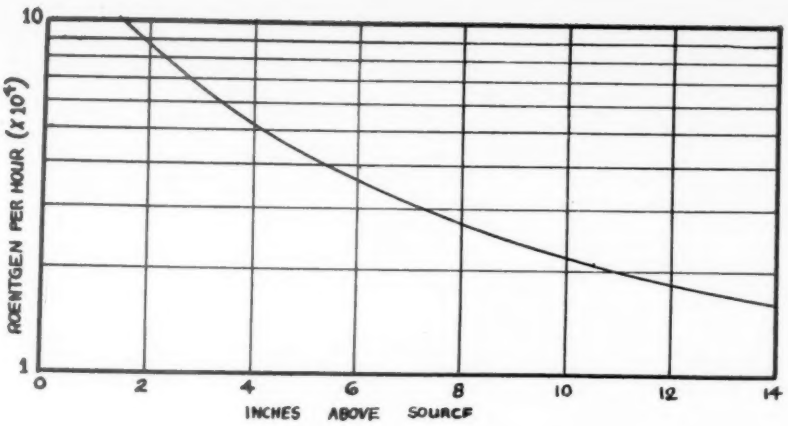


Figure 2. Dosage rate as a function of distance above the source of Co^{60} gamma radiatiation source.

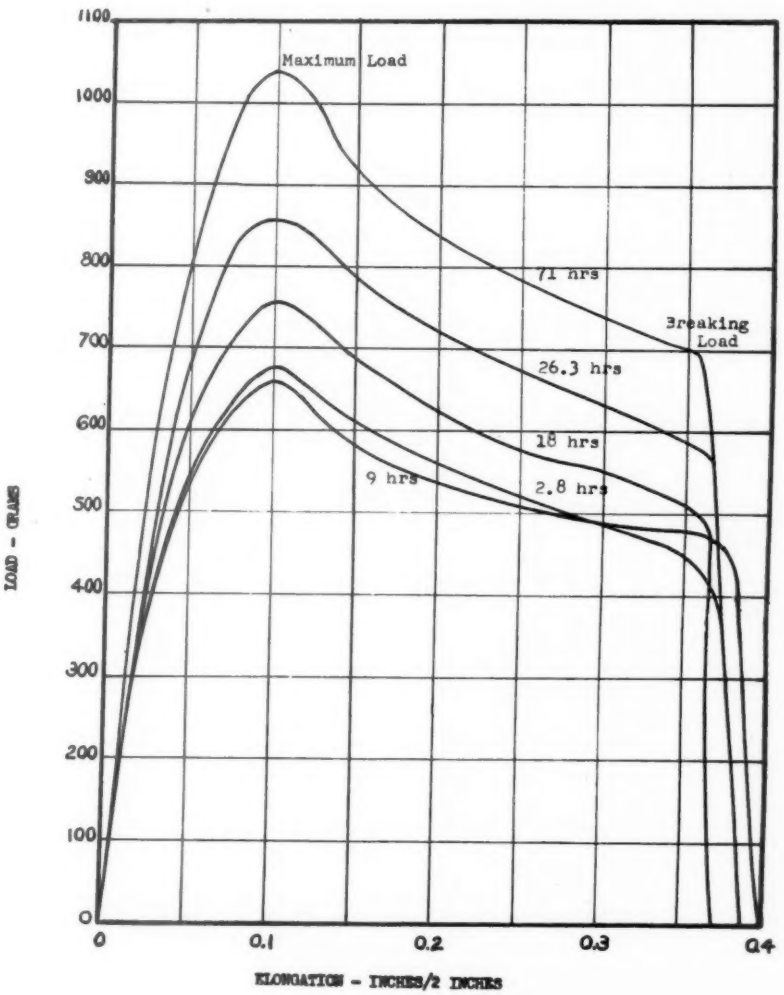


Figure 3. Effect of gamma irradiation on the load-elongation behavior of unpigmented soya-alkyd film.

Cross head speed	1.2 in/min	Film length 2.0 in.
Chart speed	5.0 in/min	Cross sectional area of film = width x thickness = 3.22×10^{-3} cm²
Full scale load	1000 grams	Cured (baked) 35 minutes at 290: F
Film thickness	0.001 in. or 1.0 mil	Driers 0.02% Mn — 0.06% Zn
Film width	0.5 in.	

Data reported as the average of 10 to 15 individual film strips.

CTR Aging in hours	Maximum Load in grams	Breaking Load in grams	Elongation in inches	Max. T.S. kg/cm²	Breaking T.S. kg/cm²	% Elongation	Toughness Area
3.4	640	470	0.36	199	146	18.0	20.5
17.5	660	470	0.40	205	146	20.0	30.5
20.2	720	510	0.41	224	158	20.5	33.8
26.6	880	620	0.40	274	193	20.0	38.2
28.3	920	700	0.40	286	217	20.0	40.5
75.7	1080	800	0.38	335	248	19.0	42.4
240.0	1100	800	0.40	342	248	20.0	44.8
Irradiated to Co^{60} films							
Dosage rate: 80,000 roentgen/hr							
2.8	670	460	0.39	208	143	19.5	31.5
9.0	660	460	0.40	204	143	20.0	31.0
18.0	760	530	0.37	236	165	18.5	34.0
26.3	860	620	0.39	267	193	19.5	37.6
71.0	1040	700	0.39	324	217	19.5	41.2

Table I—Load and elongation data from instrom measurements (Films aged in constant temperature room)

relative humidity of 50%. The films remained in the constant humidity and temperature room for one hour before they were placed in the mercury stripping bath. The time of amalgamation to destroy the adhesion between the film and panel was about 24 hours. The dislodged films were brushed with a camels hair brush to remove drops of mercury. That portion of each film which had been subjected to constant irradiation was cut into 0.5 inch wide strips lateral to the direction of application of the film to the tin panel. The ends of each strip were scotch-taped to paper in order to form grip tabs exactly two inches apart. The tensile strength was thus determined on a film strip 0.5 inch wide and two inches long. These strips were scanned carefully for flaws and imperfections before they were used. Only uniform thick films, apparently free of flaws, were retained as test specimens. Each determination recorded in Table I is the average of ten selected individual observations.

Control films were prepared as those designated for irradiation with the difference that they were air dried at 77° F and a constant humidity of 50% for 30 minutes, then baked 35 minutes at 295° F, aged 24 hours in contact with the panels, stripped and the free films were cut into test specimens as previously described.

The breaking load and the elongation were observed by the use of an Instron Tensile Tester. This instrument is very precise and sensitive. The data obtained is of a high order of reproducibility. The construction of the instrument is such that constant speed motor applies the load at a rate which

$$\textbf{Maximum tensile strength} = \frac{\text{Maximum load in kilograms}}{\text{(Film thickness in inches) (Film width in inches)}6.45}$$

$$= \text{Kg/cm}^2$$

$$\textbf{Breaking tensile strength} = \frac{\text{Breaking load in kilograms}}{\text{(Film thickness in inches) (Film width in inches)}6.45}$$

$$= \text{Kg/cm}^2$$

The elongation was expressed in per cent, thus:

$$\textbf{Per cent elongation} = \frac{\text{Final length at rupture in inches—original length in inches}}{\text{Original length in inches}}$$

$$\times 100 = \frac{\text{Final length}-2}{2} \times 100$$

Table II. Calculation of tensile strength

maintains a constant rate of elongation.

The maximum tensile strength and the breaking tensile strength were calculated to Kg/cm², Table II.

The toughness area values reported in Table I were determined with a planimeter as the area under the load-elongation curve, Figures 3 and 4, and are considered a measure of the toughness of the films.

Discussion

The non-irradiated films that were air dried at constant humidity and constant temperature were taken as a standard of comparison. The Instron data from the average test samples are plotted as load-elongation curves in Figure 3. Similar films which were irradiated as described are plotted as load-elongation curves in Figure 4. From these data Figure 5 has been drawn to graphically show the variation of tensile strength and breaking tensile strength of air dried and baked soya-alkyd resin films and wet soya-alkyd resin films which were exposed to gamma irradiation from a Co^{60} source and then baked and aged. It may be noted that the tensile strength of the irradiated films began to gain after about nine hours of irradiation whereas the tensile strength of air dried films was delayed an additional eight hours. Once the induction period of the non-irradiated films was passed, the rate of gain of tensile strength for air dried films was greater than that of the irradiated wet films. After the expiration of 26 hours of aging the tensile strength of the air dried films maintained almost a constant greater tensile value than that exhibited by the irradiated films up to 75 hours. It is interesting to note that there was little gain in the tensile strength of the air dried films between 75 and 240 hours of aging, Table I. The irradiation after 75 hours was discontinued as the film was thoroughly dry, and also since (1) for similarly irradiated air dried films there is no significant change in tensile strength.

The data, Figure 5, shows similar conditions prevailed for breaking tensile strength.

The Instron plots, Figures 3 and

(*Turn to page 91*)

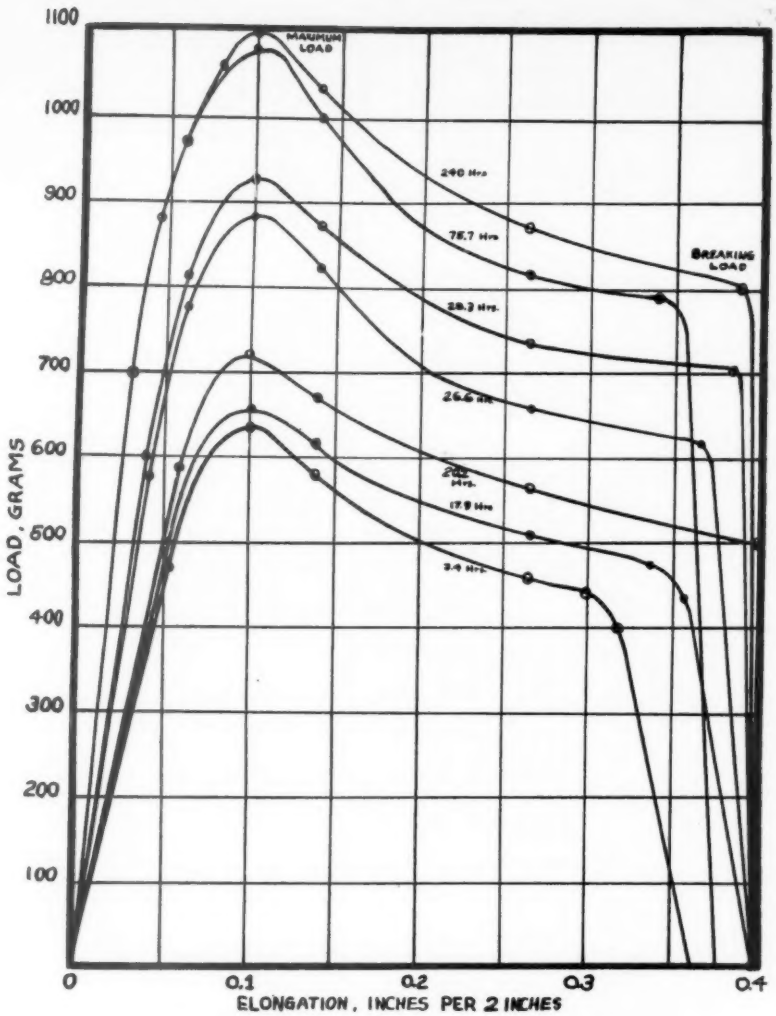


Figure 4. Effect of air aging on load-elongation behavior of an unpigmented soya-alkyd film.

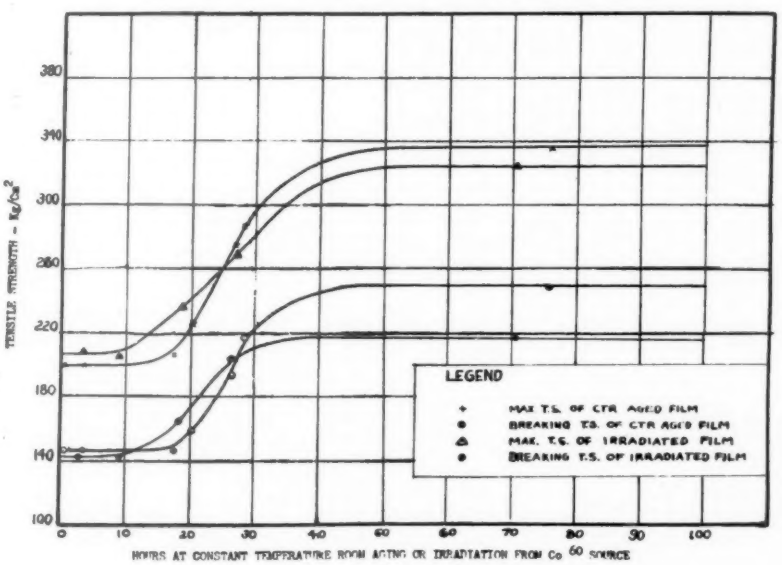


Figure 5. Variation of tensile strength versus hours of irradiation (80000 roent genper hour).

High speed carborundum mills grind paste to fine consistency.

A REPORT FROM THE SOUTHWEST:

Columbia Paint & Chemical Co.

COMBINING scientific know-how with shrewd observation and common sense, Columbia Paint & Chemical Co. of Phoenix, Arizona is making a determined bid for its share of the protective coatings trade in the southwestern market.

Through its president, A. K. Simons, a dynamic man with thirty-six years' experience in the paint industry—much of it as head of the Columbia Paint Co. in Chicago—this two-year old southwestern paint company has concentrated on manufacturing paint products designed specifically for the area's dry, hot climate.

For example, Mr. Simons observed that objectionable odors given off by paint affect allergy sufferers adversely, particularly during the drying period. Since this is an area of enthusiastic do-it-yourself decorators, he experimented with various deodorizing agents. When he finally incorporated one of them into his production, he was virtually a pioneer in the southwestern marketing area in the use of paint deodorizers. Today, Mr. Simons adds a perfumed deodorizing agent to his general interior line, as well as to most of his exterior products—with the exception of his exterior oil-based paints. He considers the more than five cents per gallon cost to be a good investment because of favorable dealer and industrial user reaction. In fact, he includes the deodorizer in the economy line, even though it cuts into budget-line profits somewhat.

Another regional paint problem is the shorter wet-edge period, caused by high summer temperatures. Columbia Paint & Chemical Co. has formulated a product which holds the lap-edge for as long as fifteen minutes, permitting even the most amateurish do-it-yourself painter to come back to the starting point without tell-tale lapping.

Formation of skin on exposed paint long has been an industry headache in dry climates. To provide protection against this, Mr. Simons inserted an anti-skinning agent at a cost of two cents per gallon.

"Not once," said Mr. Simons "have we had a return of any of our products because of spoilage. We keep our perishable raw materials inside the plant, and rotate our stock scientifically."

Mr. Simons takes pride, too, in the specially-devised testing surface he has developed for ascertaining brushing, leveling, hiding and drying power. He uses a 4′ x 8′ rough, porous plaster board covered with a special brown-colored preparation, instead of with the customary black. Both for hot and cold test, he has found this mixture to be superior to the black.

Because of the company's success in formulating for the southwestern climate, Mr. Simons has expanded the sales area to include New Mexico, west Texas and southern California, concentrating on the dealer and industrial market.

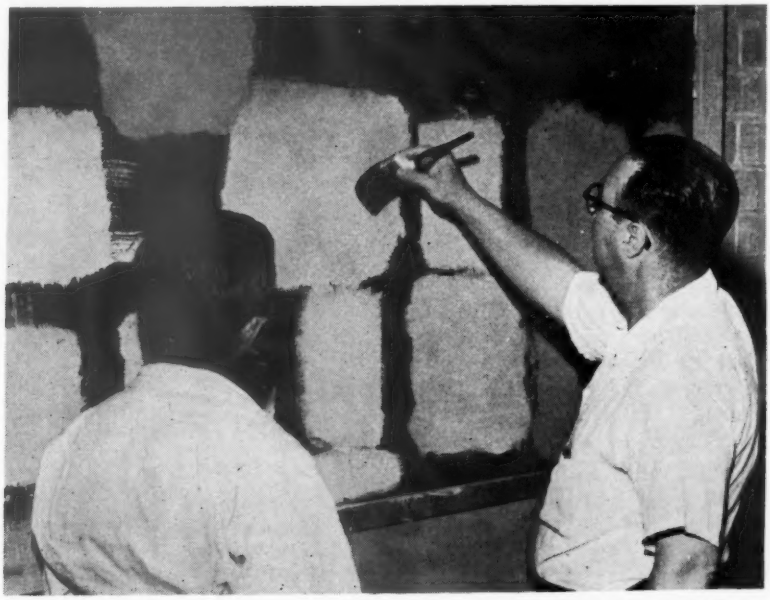
The 2,600 square foot plant, built in 1953, is completely air-cooled. The company has already initiated plans for a 5000 square foot addition which will move it even closer to the Santa Fe R.R. spur immediately behind its property. However, 90 per cent of the company's products—both raw and manufactured—are shipped in and out by truck because of the cost differential.

Mr. Simons believes that the booming residential and industrial growth currently in progress in Arizona, one of the country's fastest growing states percentage-wise, promises well for the future of Columbia Paint and Chemical Co.

High speed mixer, shown above, is used for blending varnishes.

Photo at left shows post agitating mill for mixing, let-down, and finishing of paint batch.

Section of warehouse storeroom where Columbia Paint & Chemical Company products await shipment.



Testing surface, showing sampling of board for hiding, brushing, and flow—a very important procedure in ascertaining quality of finished products. An original Columbia preparation is used on board.

THE ACTION OF BORON FLUORIDE ON LINSEED OIL*

THE STANDOLIZATION of the drying oils, a reaction which has been used for a very long time in the paint and varnish industry, is in general, realized by the action of heat on the oil. This operation is normally a fairly long process, conducted in closed vessels with the exclusion of air necessitating an appreciable expenditure of fuel and conducted according to a technique which has evolved and changed very little over the years.

Mention should, however, be made of the recent appearance of apparatus permitting the standolization under reduced pressure leading to a fairly appreciable gain in time on the heating schedule, but which necessitates a more complex installation.

Speaking in the broad sense of the term, no use has ever been made of catalysts which are capable of modifying radically the kinetics of this reaction. Although numerous patents have been issued, in this sense, it would not appear that they have produced any process which could be used industrially.

Among the catalysts that can be used are: peroxides, sulfurous gas, sulfuric acid, finely divided metals such as platinum, palladium, cobalt, nickel, etc.; catalysts of the Friedel-Craft type, sulfonic acids, etc.

Among the catalysts there are two which appear to be of particular interest and which the petroleum industry has utilized for several years, namely boron tri-fluoride BF_3 and hydrofluoric acid HF.

These two catalysts are effective in various reactions such as alkylation, esterifications, condensations, polymerizations, isomerization, and give good yields. They offer the advantage of being gaseous, are easily soluble in a great number of reaction chemicals and are easily eliminated either by heating under a vacuum or by washing with water.

These various considerations led the authors to study the action of these catalysts on drying oils, particularly linseed oil, limiting the research work to the action of boron tri-fluoride.

A number of studies have previously been made in this direction and have sometimes been the object of patents. Thus Eichwald (1) has proposed utilizing boron tri-fluoride to polymerize the "foots" of soya bean oil for their use in compounding lubricating greases. Concerning another patent of Uloth and Muller, (2) the soya bean oil is thickened at 130° C. in the presence of 2.8 percent of boron fluoride.

Other published works deal with a somewhat more scientific approach; the work of Topchiev and Wishnyakowa needs to be mentioned (3) in which ethyl oleate is polymerized by utilizing a complex boron tri-fluoride—phosphoric acid and observing the formation of the dimer of oleic acid.

The works of Croston, Tubb, Corvan, and Teeter (4) cover the polymerization of the esters and fatty acids of soya bean oil under the influence of boron fluoride and of hydrofluoric acid. An important polymerization is observed at 150° C. in the presence of 2 to 4 percent of boron fluoride. The esters obtained have a very deep brown color and an acid index of around 25.

In the case of hydrofluoric acid the results obtained are of the same order but necessitate a larger quantity of catalysts (up to 20 percent) and the experimental realization is more delicate because of the corrosive and toxic effects of the catalysts; however as against this, the bodies obtained are more clear.

For various reasons the reaction takes place at room temperature. No information is available on this reaction with linseed oil. The following is concerned with an investigation involving the reaction of boron trifluoride on linseed oil.

The linseed oil which was utilized for the investiga-

*This article is based on recent work done in France by J. Petit and J. Cazes published in Pigments-Vernis (vol. 30, No. 10, 823-829)

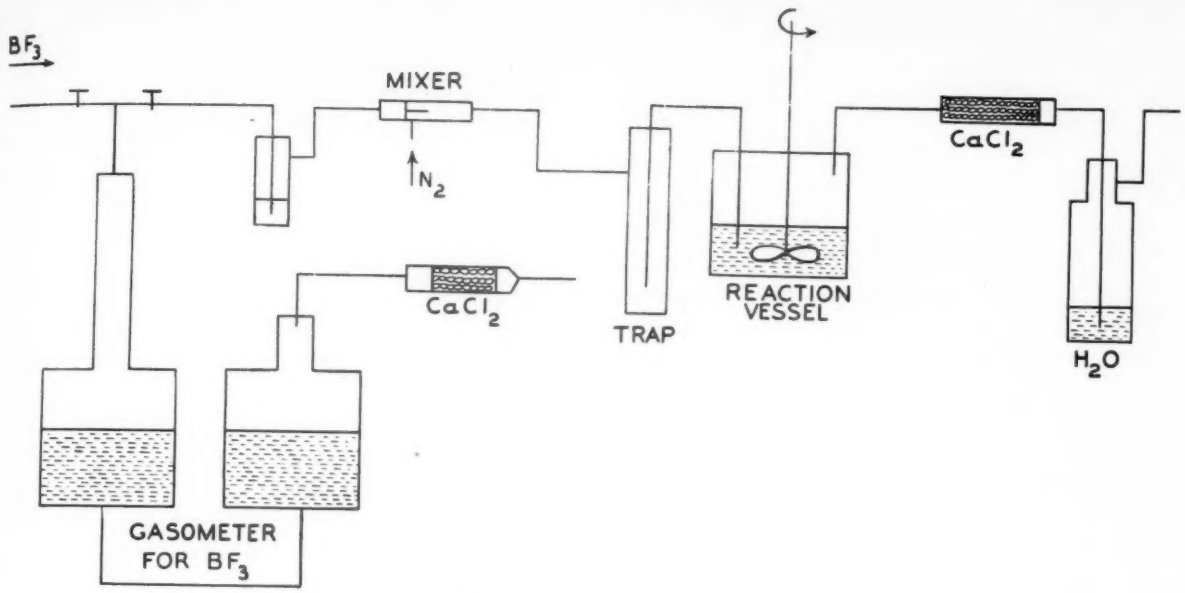


Figure 1. Experimental set-up

tion was a refined and neutralized oil having the following principal physical constants:

N_D^{25} = 1.4803 (Refractive Index)

Acid Index = 0.4
Saponification Index = 192
Iodine Index = 187

The boron fluoride utilized was a commercial boron tri-fluoride compressed in a steel bottle making it easy to handle and manipulate.

The first qualitative tests conducted consisted in passing the gas into the oil at normal temperature. It was immediately found that this technique was impractical for two reasons: (1) great solubility of the boron fluoride in the oil ran the risk of causing oil to return back to the gas bottle and (2) local concentrations of the catalyst in the oil causing instantaneous gelation of the oil in these zones with the formation of skins and gelled agglomerates.

A suitable layout of the experimental apparatus is shown in Figure 1.

Passing from the steel gas storage bottle by the intermediary of a special pressure reducing valve, the boron fluoride is stored in an intermedate gas meter. The connection between these two apparatus is achieved by means of a flexible tube of polyvinyl chloride. This plastic material seems to resist fairly well the action of the boron fluoride, although plasticizers incorporated were often found to be strongly attacked. In any case, rubber cannot be used; polyethylene tubes are preferable!

The valve taps of the gasometer are greased with a silicone grease which should be replaced from time to time. The balance liquid used in the gasometer was a simple paraffin oil.

Passing from the gasometer under a low pressure of the order of some centimetres of water, the boron fluoride is passed to a mixer in which it can be diluted with an inert gas (nitrogen).

After having passed through a trap flask, this gaseous mixture bubbles into the oil contained in the reaction flask causing strong agitation. The reaction flask comprises in addition a thermometer, an inserted tube for taking tests and a tube for evacuation of the gases. The latter is joined by a calcium chloride guard tube to a water trap flask.

The quantities of oil taken for the experimental tests were from 100 to 150 grams and the quantities of boron fluoride were determined by weighing the reaction flask before and after bubbling the gas through. On this latter point, the gasometer can also give some indication although it is less precise.

The corks of the reaction flask should be changed after each test because of the intense corrosion due to the boron fluoride. The elimination of the catalyst is accomplished by washing with water the ether solution of the crude product to a neutral point using Congo Red as a indicator. The ether is distilled and the product is dried under vacuum until the froth disappears completely. It is quite possible to remove the catalyst by heating the reaction products under vacuum, but this may cause some undesirable side reactions.

Temperature

The reaction temperature was the first factor which was examined by the two workers to determine the fundamental differences between the simple thermal polymerization and the catalytic polymerization. During the first series of tests it became quite clear that other factors are involved and these will be discussed later.

Regarding the temperature, the most remarkable phenomenon would seem to be the existence of a "critical" temperature for which one observes a gelation reaction similar to that of Chinawood oil. The exothermic effect is still more remarkable. Thus, in

heating to 170° C. a linseed oil containing 1.2 percent of boron fluoride, the temperature rose suddenly to 220° C. at the same time gelation occurred. Also, considerable amount of boron tri-fluoride entered the reaction (on a reacting mass of 100 grms.).

This temperature is well defined according to the nature of the oil and the concentration of the catalyst.

It was confirmed that it is sufficient to hold conditions at 10° to 20° C. below this temperature to obtain a normal polymerization reaction. The speed of polymerization is then all the more rapid as the temperature approaches the critical temperature while practically no reaction is observed if the operational temperature is too far removed from this critical temperature.

Thus, in taking as a criterion for the degree of polymerization the variation of the refractive index, there was obtained at the end of 15 minutes of heating and for a concentration of 1.2 percent of boron fluoride, the following results:

Temperature °C.	Refractive Index (N_D^{25})
90°	1.4820
110° - 120°	1.4820
140° - 150°	1.4850

It was confirmed experimentally that for concentrations of boron tri-fluoride of the order of 0.5 to 0.8 percent practically nothing is produced even after heating at 250° C. for 30 minutes. Under such conditions no appreciable polymerization was ever confirmed and the increase in viscosity was practically nil.

For concentrations between 1 and 1.4 percent the exothermic reaction is produced between 160° and 170° C. In maintaining the temperature at 150° C. the polymerization is produced normally with a gelation time of 30 to 40 minutes.

For concentrations between 1.5 and 1.7 percent a temperature of 120° C. leads rapidly to the gelation. In operating at 105° to 110° C. the gelation is produced at the end of about an hour of heating. It was found that to obtain a similar viscosity, it is necessary under these conditions to apply a longer heating time than in the case of a concentration of 1.00 percent, while obtaining, on the contrary, a lower refractive index on the final product. (See Table I)

Concentration	Temperature	Time	Refractive Index n_D^{25}
Percent			
1.1	150° C.	20 min.	1.4892
1.6	105° C.	40 min.	1.4880

Table I

For a concentration of 2 percent the gelation is produced in 10 minutes at 105° C. It was necessary to maintain the temperature at 95° C. to obtain a normal polymerization in an hour.

For concentrations above 2 percent the tests were conducted at normal temperature. The absorption of the catalyst became more difficult from 3 percent and there was observed an increase in the viscosity which was appreciable from 5 percent.

Table II gives the results of the tests at normal temperature.

Concentration of BF_3	Gelation time at normal temperature (18-25° C.)
4 Percent	15 Days
4.9	3 Days
6	40 Hours
6.8	24 Hours

Table II

In the last case, a test sample which was taken 2 hours before the gelation was an oil of a yellowish-orange color having a very high viscosity and a refractive index:

$$N_D^{25} = 1.4888$$

It is necessary also to remark that under such conditions the gelation is not instantaneous and is produced without any noticeable exothermic effect. The oil passes through an intermediate stage where it is no longer liquid but remains, however, entirely soluble in ether. This was the basis upon which these investigators determined the gelation time.

The manner of introducing the catalyst in the oil appears also to influence the course of the reaction. It was of interest first to prepare solutions with a high concentration of boron fluoride. This method allows a more precise determination of the concentration for the more dilute solutions, which are derived from the mother solution. It was found that this method led to a marked reduction in the heating time; thus, in diluting from 7 percent down to 1 percent the gelation was produced at the end of 10 minutes of heating at 150° C. (30 minutes under normal conditions).

Heating Time

There was found, generally speaking, a rapid increase in the refractive index at the beginning of the reaction, which tends subsequently towards a limit without a correlative increase in the viscosity. On the contrary, this latter increases rapidly in the neighborhood of the gelation. (See Table III).

Concentration of Boron Fluoride BF_3	Temperature	Heating Time in Minutes	Refractive Index n_D^{25}
1.2 Percent	150° C.	10	1.4877
		15	1.4879
		30	1.4892
1 Percent	150° C.	15	1.4881
		20	1.4886
		30	1.4889
2.1 Percent	95° C.	50	1.4892
		60	1.4892

Table III

In the last case, the increase in the viscosity is considerable in 10 minutes (end of the reaction) while the refractive index remains unchanged.

Oil Composition

It would appear to be self evident that this composition will have an influence on the course of the polymerizing reaction, according to the content in polyenic radicals. It was desired, however, to obtain proof of this fact.

With a Chinawood oil, having a very high content of conjugated trienic radicals, the reaction is too rapid to be controlled; the first gaseous bubble, however low its concentration in boron fluoride is, causes, in the cold, an instantaneous gelation around the extremity of the gas lead-in tube, impeding the passage of the rest of the gas.

To modify the composition of the linseed oil used, this was split into two distinct fractions, by chromatography on a column of alumina:

1. A fraction by hexane: 86 percent
2. A fraction by alcohol: 14 percent

The hexane fraction has a lower non-saturation than that of the linseed oil, while that of the alcoholic fraction is higher.

These two fractions were allowed to polymerize, like the oil itself.

The results obtained show that the hexane fraction polymerizes less readily than the initial oil, while it is the reverse in the case of the alcoholic fraction. (See Table IV).

Influence of Diluent Gas on the Boron Fluoride. An attempt was made during the course of the tests to replace the nitrogen diluent gas by carbon dioxide gas, but the use of the latter had to be renounced because it seemed to cause an inhibition of the catalyst. Thus, in heating for 15 minutes at 130° C., then for 15 minutes at 160° C., a solution with 1.6 percent of boron fluoride, operating conditions which lead with certainty to the gelation of the oil under a current of nitrogen, practically no increase in the viscosity of the oil was observed with carbon dioxide. Only the refractive index increased and exceeded 1.4887.

Influence of the State of Drying of the Oil. It was confirmed with the first tests that this factor does not intervene in the subsequent procedure of the reaction. Whether the oil is taken for use directly without any precautions or after a prolonged drying under vacuum with agitation, the results obtained are identical.

In a quite general manner, the properties of the standoils obtained in the presence of boron fluoride differ little from those corresponding to normal commercial standoils.

As for these properties, the viscosity can be very variable according to the conditions of preparation. It is, in spite of everything, somewhat delicate to stop the reaction at a very high value which often corresponds to the initial acceleration of the reaction and causing gelation.

The acid index obtained, after elimination of the catalyst, is always low and never exceeded 5 during the course of numerous tests.

The saponification index suffered practically no variation, remaining always in the neighborhood of 190.

The iodine index suffered variations analagous to those which one observes during the thermal treatment with the standolization process; figures were obtained varying between the value of the crude oil and 130. An important question and one which is of prime significance for the utilization of the product in the

Fraction	Content of BF_3	Temperature	Time of Heating	'Observations
Hexane Fraction	1.7 Percent	120° C.	60 minutes	No appreciable polymerization
Hexane Fraction	2.9 Percent	110 - 120° C.	35 minutes	Near to gelation
Alcoholic Fraction	1.7 Percent	110 - 120° C.	8 minutes	Gelation

Table IV

Treatment

If in place of starting with the crude oil, one utilizes the oil having already been exposed to a treatment with the boron tri-fluoride without appreciable result, then having applied the normal treatments of washing and neutralization, it was found during the course of the new treatment with boron fluoride that there was a rapid increase in the viscosity from the beginning of the treatment, and it is possible, in this case, to obtain a rapid polymerization with a low concentration of boron fluoride. (See Table V).

Treatments	Content of BF_3	Temperature	Time of Heating	n_D^{25}	Observations
First	1 Percent	120 - 130° C.	90 minutes	1.4882	Low Viscosity
Second	0.5 Percent	110° C.	15 minutes	—	Gelation

Table V

paint industry, concerns the drying properties of polymerized oils of this type.

It was found by examination on varied samples, that in every case, an excellent drying behavior was observed, much superior to that of the crude oil and even to that of normal simple, thermally treated standoils. For example, a test dried completely in 2 hours 30 minutes (cobalt driers) at normal temperature.

In addition, there was observed a significant discoloration of the film during the course of this drying. In actual fact, the oils treated with boron fluoride all have a more or less marked coloration, which can range from a yellowish orange to a reddish brown, resembling that of isano oil. This question of the coloration will be discussed later.

Regarding the chemical composition of the polymerized oils, some "rapid" determinations were made, allowing estimates of the various constituents.

The method utilized was that developed in the laboratory for the complete study of thermal standoils; the method embodied saponification and extraction of the unsaponifiables, regeneration of the acids, transformation into ethylic esters. These esters are then distilled under a vacuum to eliminate the monomeric acids, the residue is chromatographicized, permitting a separation of the dimeric acids and of the trimeric acids.

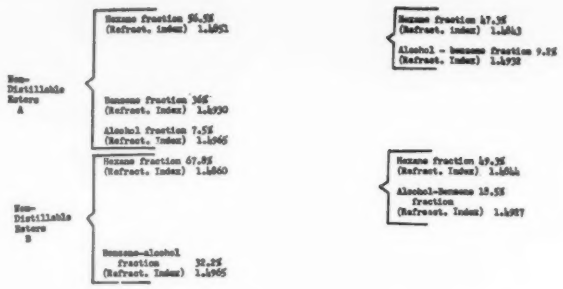


Chart A

that notably in the case A, corresponding to a gelled standoil, the proportion is higher than in the case B, corresponding to a normal standoil as regards its appearance.

For purposes of comparison, the following gives the composition which was obtained in addition for a thermally treated standoil which was submitted to 52 hours of polymerization at 280° C.

	%
Monomeric acids	52.8
Dimeric acids	31.5
Trimeric acids and oxidized trimeric acids	15.7

Method of Preparation

BF_3	Temperature °C.	Time	Aspect	Distillate Percent	Residue Percent
7 Percent	Normal	24 Hrs.	gel.	59	41
2.12	120	10 Min.	gel.	58	42
A 1.6 Percent	110	55 Min.	gel.	65	35
B 1.6 Percent	110	47 Min.	standoil	67	33
1 Percent	150	60 Min.	"	64	36
Industrial Normal Standoil	280	52 Hrs.	"	52.8	47.2
Standoil under Vacuum	310	3 Hrs.	"	45.5	53.5

Table VI

Table VI indicates the proportions of monomeric acids and of polymeric acids obtained in different cases.

From this table, it clearly follows that the proportion of non-polymerized acids is higher in the case of the standoils polymerized in the presence of boron fluoride, even if there is gelation. This proves already a difference between the two methods.

For the products A and B, the residue of non-distillable acids has been transformed into ethylic esters by the normal method and these latter were submitted to a series of chromatographics on alumina. (Chart A)

The hexane fractions representing the esters of dimeric acids and the benzene-alcohol fractions representing the sum of the esters of trimeric acids and of the trimeric oxidized acids, one arrives at the following proportions of the types of acids for the bodies A and B: (See Table VII).

It can be confirmed, according to these figures that the proportion of trimeric acids is relatively high and

There is accordingly a fundamental difference in the constitution of standoils processed in the presence of boron fluoride and those obtained by the normal procedure. This difference centers on two different points:

1. The standoils catalyzed by boron fluoride are

	Monomer Acids %	Dimeric Acids %	Trimeric Acids and Oxidized Trimeric Acids %
A	65	16.5	18.5
B	67	16.2	16.7

Table VII

richer in monomeric acids than the thermal processed standoils (cooked oils) having the same viscosity. Even in the case of oils completely gelled, this difference persists;

2. The ratio of the trimeric acids to the dimeric acids is much higher in the case of standoils catalyzed with boron fluoride. This fact explains in addition very well the rapid gelation of the oil by virtue of the appearance of these trifunctional acids, causing very quickly a reticulation of the entire system, although an important proportion of the monacids may have escaped the dimerization.

Coloration Problem

During the course of all the tests, there was confirmed each time a more or less marked accentuated coloration of the oil treated by the boron fluoride. This coloration can pass from a yellowish orange to a reddish brown and it resembles the color of crude palm oil.

The coloration appears in the cold after some minutes of bubbling in the boron fluoride. It is at first reddish, then it passes to brown for a concentration of about 1 percent then to a dark brown by subsequent heating. The elimination of the catalyst by water washings gives an oil whose tint is much less pronounced but which is always more or less red by transparence. This coloration disappears if the oil is heated to 250° C. to give way to a yellowish tint accompanied by a particularly marked blue fluorescence.

It practically disappears during the drying of the oil in a thin coating to give dry films having properties identical to that of ordinary standoils.

Several causes would seem to intervene regarding the coloration of the final product. First, there is the composition of oil. It has been confirmed that the composition of the oil modified by treatment with hexane on a column of alumina gives after polymerization a clear red product while the complete oil leads to the formation of a product which is much browner. Again, the temperature of heating of the oil is a further influencing factor. The oils treated at 150° C. are more tinted than those treated at 110° C. If the polymerization is made at the ordinary temperature, the coloration is scarcely reddish.

The concentration in boron fluoride does not seem to interfere since it is precisely those products which have been in the presence of more of the catalyst and reacted at normal temperatures that are the least tinted.

Different hypotheses can be envisaged to attempt an explanation of this coloration.

The most simple one consists in supposing that the catalyst reacted with an impurity contained in the oil to give a colored compound tinting the mass of oil, in the manner that carotene colors palm oil.

This hypothesis was very quickly rejected for various chromatographic studies on alumina have proved that this coloration cannot be eliminated by such a treatment. The oil passes entirely colored without abandoning anything on the absorbent. The coloration is accordingly a property inherent in the molecules of the polymerized oil. One can equally suppose that under the effect of boron fluoride, polyenic conjugated systems can be formed and gives a coloration which is due to the accumulation of double bonds. This hypothesis has not been retained for various reasons. On the one hand, too great a number of double bonds would be necessary for giving the reddish tint observed; a fact which is incompatible with the initial structure of the oil. On the other hand, such acids, if they existed, could be recovered, at least partially in the distillable fractions obtained during the separation of the total acids arising from the saponification of the standoil. Now, all the distillable acids are always presented in the form of practically colorless products.

When polymerization is carried out on the total ethylic esters instead of linseed oil, it is noted after saponification and distillation that the same reddish-brown coloration appears.

The distillation of the whole product, after elimination of the catalyst, proves that the coloration persists in the non-distillable residue, while the monomeric esters pass with no color.

This residue, chromatographized on alumina, gives a clear yellow hexane extraction, a deeper yellow benzene extraction while there remains fixed at the top of the column an appreciable brownish zone.

This zone is easily extracted by alcohol and after the solvent has been removed a brownish viscous liquid is obtained by reflection, which is a marked reddish by transparence. It represents about 2 to 3 percent of the total amount of esters.

In the case of esters prepared by starting from a standoil catalyzed with boron fluoride, the results of the distillation and of the chromatography are reproduced in an identical manner. Similarly in the tail of the chromatography, strongly colored bodies result when starting from ethylic esters originating from normal standoils.

In this last case, it has been possible to show that one is in the presence of radicals of more or less oxidized trimeric acids.

The ester which is strongly colored has been found to have the following analysis (combustion method):

Carbon = 76.2% Hydrogen = 10.3%

In the case of the ethylic ester of a pure linoleic trimer, the theoretical figures are:

Carbon = 77.86% Hydrogen = 11.76%

There is accordingly a very clear deficit in carbon content in the above case which can only be compensated for by supplementary oxygen. It is due to the presence of this latter element, engaged in a chromophoric system (most probably ketonic) that causes the coloration of the linseed oils polymerized in the presence of boron fluoride. One must not lose sight of two fundamental conceptions:

1. It is practically impossible to obtain a linseed oil which is free from traces of oxyacids (hydroxylized, epoxydic, hydroperoxides, etc.).
2. The boron fluoride is not only an agent of isomerization and of polymerization; it is also a powerful dehydrant and a condensation agent.

From the above facts it becomes possible to explain the set-up of the coloration phenomenon:

a. Under the influence of the boron fluoride, acting as a dehydrant, the polyhydroxylic or

hydroperoxidic acid radicals give ketonic forms. The orangy red color appears if this double bond is engaged in a cross-conjugated system (quinonic, fulvenic or pseudo-fulvenic). These are far from being negligible in the case of linseed oil; Given a minimum concentration, coloration is manifested.

b. It is from this fact, impossible to isolate the coloration by chromatography of the oil itself, because of the chance distribution of these chromophoric radicals in the molecules of glycerides, polymerized or not.

c. This group of colorants can, on the contrary, be isolated after destruction of the glyceridic structure; their polarity then permits selecting them from the other non-colored molecules, which are less polar.

d. The heating or oxidation of the colored oil can lead to a disappearance of the color; the systems of cross-conjugated double bonds react easily with another double bond by Diels-Alder reaction to give a body not presenting the particular structure of the first system. This causes the disappearance of the chromophoric effect in the visible spectrum.

A remarkable example is the combination of dimethylfulvene (red body) with maleic anhydride to give a colorless compound.

It is necessary accordingly, in order that the coloration should disappear in the case of the oil, that such reactions can be produced, that is to say by thermal polymerization or autoxypolymerization. Effectively, this is the phenomenon observed during the heating to 250° C. or drying in air.

e. The phenomenon of coloration of the oil under the dehydrating influence of the boron fluoride can be correlated with that observed during the esterification of the total acids of linseed oil or of standoil. In effect, to obtain a good esterification, it is necessary to induce a particular dehydrating condition which one can confirm systematically a more or less by the intense browning of the mass, increasing at the end of the reaction. Apart from the molecules of water evacuated by the normal reaction, others are detached everywhere making it possible for them to form.

Theoretical Aspects

In a general fashion, the polymerization reaction by boron tri-fluoride are due to the particular electronic structure of this compound. In actual fact, two electrons are lacking at the boron octagon (See Figure 2). This will accordingly always have the tendency to render itself complete by the capture of a pair of electrons each time that this becomes possible. Under such conditions, an intermediate addition compound is formed, which can, in some cases, lead to stable ionized compounds, for example with hydrofluoric acid (See Figure 3).

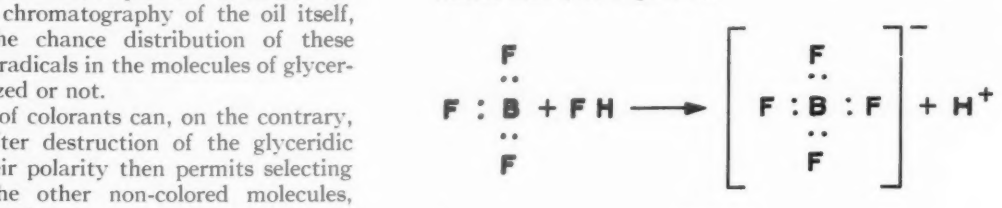


Figure 2

Figure 3

The boron tetrafluoride ion (BF_4) is particularly stable. However, less stable compounds are formed as for example, in the case of the olefines (See Figure 4).

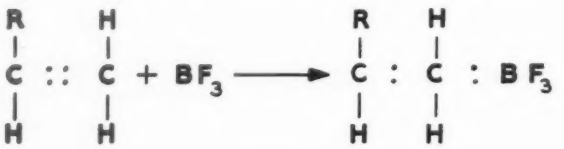


Figure 4

The compound thus formed is very reactive because of the temporary trivalence of the substituted carbon. This unstable ionic structure will have the tendency to re-establish its electronic equilibrium to the detriment of another molecule(See Figure 5).

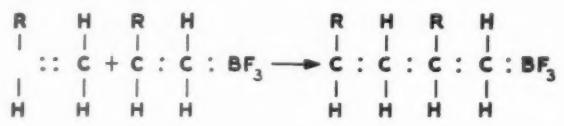


Figure 5

This process will reproduce itself until the boron trifluoride leaves the organic molecule, caused by deactivation.

This necessitates a re-arrangement of the electronic structure of the molecule, resulting in stability (See Figure 6).

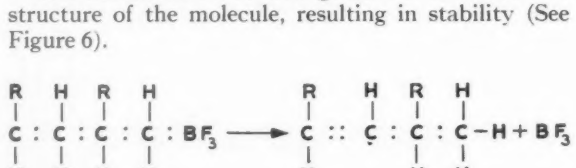


Figure 6

The example discussed here represents the general case of vinylic polymerization, but from this at least two fundamental facts emerge:

1. The boron tri-fluoride cannot act in the form of traces to affect the polymerization because it is indispensable that intermediate addition compounds are formed.

(*Turn to page 97*)

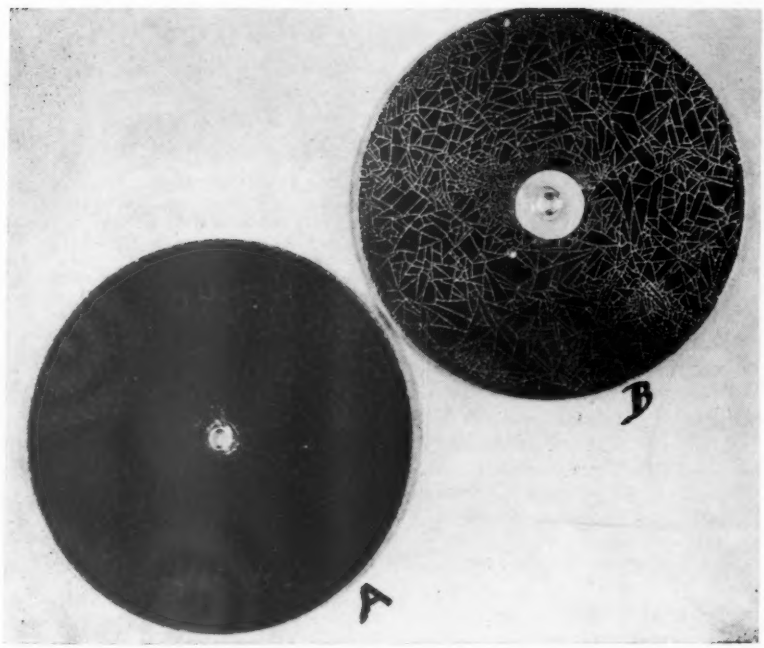
PREPARING THIN ASPHALT FILMS BY SPINNING

A RAPID method for preparing thin asphalt films[1] for test specimens has been developed by the National Bureau of Standards in connection with a study of asphalt weathering properties. By this method, thin films are readily obtained by pouring molten asphalt on a rapidly spinning disk; the variables in the procedure can be controlled to produce film thicknesses from 0.0005 to 0.050 in. The procedure was developed by L. R. Kleinschmidt of the Bureau's floor, roof, and wall coverings laboratory.

In the study of asphalt degradation, many replicate test specimens are usually prepared for exposure either to outside weathering conditions or to light, heat, and water in accelerated exposure test machines. In some of the tests at NBS where specific coating thicknesses greater than 0.015 in. are required, the specimens are prepared by either the doctor blade or the hydraulic press method. However, these methods are satisfactory only when coatings thicker than 0.015 in. are desired.

In an effort to prepare thinner films, another method was sought, and the one originally developed for paint and varnish films by pouring such materials onto a spinning disk[2] was examined. This

(*Turn to page 98*)



These two asphalt test specimens were prepared by the method developed at the National Bureau of Standards, and then exposed to accelerated weathering conditions. Photo shows distribution of weathering configurations of samples 0.002 in. thick. Specimen A was exposed to an 1100-hr. weathering cycle involving both light and water; specimen B was exposed to 100-hrs. of light only. Weathering configuration reveals that the coating is uniform over the entire area.

A rapid method for preparing this asphalt films for test specimens has been developed by the National Bureau of Standards. Demonstrated here is the operator pouring molten asphalt onto a rapidly spinning disk (hidden inside protective shield) Variables in the process can be controlled to produce any film thickness from 0.0005 to 0.050 in.

NEWS

Isocyanates Symposium Featured at N.Y. Meeting

A two man symposium on "Isocyanates" highlighted the February 2nd meeting of the New York Paint and Varnish Production Club. The speakers were Dr. Herman F. Mark of the Polytechnic Institute of Brooklyn, and Robert L. Terrill of the Spencer-Kellogg Co.

H. F. Mark

Dr. Mark, who is director of the Polymer Research Institute at the Polytechnic, and was Mattiello lecturer at the last paint convention, evaluated the contribution of isocyanates to polymer chemistry.

Mr. Terrill, manager of industrial products research for Spencer Kellogg & Sons, Inc., Buffalo, N.Y. discussed the preparation, performance characteristics, and future possibilities of urethane oils and alkyds.

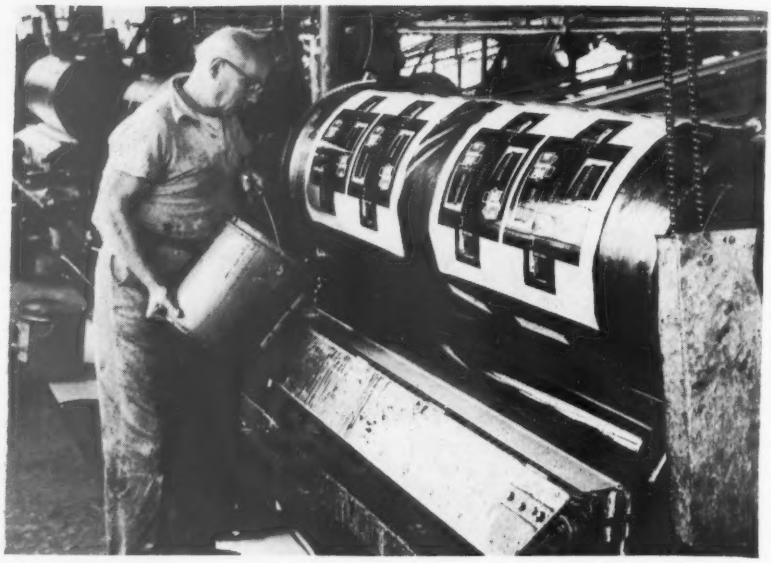
•

Technical Talks Given At Nat. Starch Seminars

Technical and sales management personnel from nationally known paint companies located in the Chicago area, recently attended two paint seminars held in Chicago by National Starch Products Inc.

Among the subjects discussed were: Polymerization and testing of vinyls and vinyl copolymer emulsions; critical pigment volume concentration studies of polyvinyl acetate emulsions; extender studies and formulation of primers, interiors and exteriors.

L. J. Horan, supervisor midwest sales, resin division, presided at the seminars. Talks were presented by Dr. A. I. Goldberg, supervisor of resin research, F. "Phil" Liberti, supervisor paint laboratory and H. J. Zahrndt, assistant to the vice president. A "round table" question and answer period was held after the formal presentations.



NEW LACQUER: Half-second butyrate, a new lacquer material that is said to produce a superior decorative and protective coating for paper, boxboard, and foil has been perfected by Eastman Chemical Products, Kingsport, Tenn., a subsidiary of Eastman Kodak Co. It is being plant tested by applying it on three-color box covers for a popular line of Kodak cameras at the John W. Crawford Co., New York City, one of the leading coating plants in the country. Photo above shows half-second butyrate added during the coating run to maintain a minimum level in the fountain of the Chambers paper coating machine.

Appoint Tall Oil Judges

Albert Scharwachter of Arizona Chemical Co., chairman of the Tall Oil Division of the Pulp Chemicals Association has announced the appointment of Dr. Walter J. Murphy, American Chemical Society, Washington, D.C.; Dr. Henry F. Payne, University of Florida, Gainesville, and Dr. Francis Scofield, National Paint, Varnish & Lacquer Association, Inc., Washington, D.C. as the judges who will decide the three winners of the Tall Oil Awards.

These are cash awards offered for the best original papers on tall oil.

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Committee D-1 to Meet

The American Society for Testing Materials will hold its 1956 Committee Week and Spring Meeting Feb. 27-Mar. 2 at the Hotel Statler, Buffalo, N.Y. Among the committees scheduled to meet is D-1 on Paint, Varnish, Lacquer and Related Products.

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Ferro Announces Plans

Plans for a new $240,000 building and equipment expansion have been announced by C. D. Clawson, president of Ferro Corp., Cleveland, Ohio. The new program will take place in the Color Division.

Award for Creative Work Set Up by Chemical Group

Creation of an annual award for "creative work in synthetic orgainic chemistry" has been announced by R. W. Hooker, president of the Synthetic Organic Chemical Manufacturers Association. The award will be administered by the American Chemical Society.

The first of its type, this award has been created "to recognize and encourage creative work in synthetic organic chemistry," and consists of $1,000, a certificate and a gold medal. Suitable traveling expenses for receipt of the award will be furnished the recipient.

The rules of eligibility state that the award is to be made "for creative work in synthetic organic chemistry published in an American journal during the preceding three years ending January 1 of the year in which the selection is made." It will be presented for the first time in 1957.

The SOCMA Research Committee which created the plan for this award is comprised of Dr. Ernest M. May, Otto B. May, Inc., Chairman; Dr. Alvin H. Tenney, Carbide and Carbon Chemicals Co.; and Dr. August Merz, American Cyanamid Co.

NEWS

"Pliolite S-5" Paints Used On Power House Interiors

Approximately 5000 gallons of paint based on "Pliolite S-5" was recently applied to the power house interiors of Lookout Point Dam and Dexter Dam. Both are located on the middle fork of the Willamette River in south central Oregon.

Using Federal Paint Specification TT-P-91a as a standard, paints were furnished for the project by the Miller Paint Co. of Portland. "Pliolite S-5," the basic ingredient of these paints, is a synthetic rubber resin produced by the Chemical Division of The Goodyear Tire & Rubber Co.

Actually, the paints were formulated with a higher rubber resin content than that designated by the specification to insure completely maximum protection to the applied surfaces.

Finishes, supplied in buff, green and beige, were used on the walls, ceilings, and in some instances, the floors. One coat of "Pliolite" primer and two coats of high resin content finish were applied to all surfaces.

In the main generator room alone of the Lookout Point Dam, more than 170,000 square feet of floor and wall surface were covered with the rubber resin-based paint.

A major problem existed at these installations because of the absence of windows in both power houses. By using color schemes chosen by U. S. Army Engineers, the maximum amount of light reflectance was realized. The applied buff, green and beige finishes permit efficient use of artificial lighting and provide attractive interior.

The brushing, flow and leveling properties of the paints used permitted completion of the installation on schedule. The finishes, said to be extremely resistant to detergents, soaps, and harsh cleaning compounds, are expected to retain their attractive, fresh-painted look for several years.

One of the turbine rooms at Lookout Point Dam where one coat of "Pliolite S-5" primer and two coats of high rubber resin content paint were applied, a formula given all surfaces in project.

Muting of Bright Car Colors Is Predicted

Advances in paint chemistry are bringing new and more durable colors to the nation's highways, according to William M. Stuart, president of the Martin-Senour Co., Chicago.

Predicting an upswing in more grayed tones, Mr. Stuart said that bright automobile colors will continue to be popular although in more moderate shades and combinations.

The public demand for broader use of color on automobiles is a manifestation of the general color revolution that has taken over the home furnishings field and, more recently, the appliance industries, he asserted.

In all these areas, he added, the public acceptance of a broader palette has been aided by improved techniques in the manufacture of paints and metal finishes.

For the automotive industry, Mr. Stuart said, recent laboratory developments will result in a wider range of metallic colors. Strong competition will keep a wide selection of colors on the market. New colors will be introduced and some of the striking pinks and fuschias will disappear.

The new colors will have greater hardness, better adhesion, improved gloss retention, and more durability, he added.

KEEPING UP-TO-DATE: Schenectady Resins, Division of Schenectady Varnish Co., recently held a technical sales conference at which all technical representatives were acquainted with new applications in the company's synthetic resin line. At the same time, the technical representatives handed in reports which will aid in improving and developing resin products.

NEWS

Troy Initiates Plan To Lease Machinery

William Harrigan, marketing specialist for the Troy Engine and Machine Co., Troy, Penna., and former industrial engineering consultant to the U. S. Department of Defense and the United Nations, has inaugurated a full scale sales campaign to place Troy Processing Machinery on the property of financially responsible concerns on a Lease Basis, with an Option to Purchase for a nominal figure at some predetermined date. The plan actually enables the machinery to earn its way and the rental payments are its rate of depreciation.

Mr. Harrigans contention is that if a concern's capital is worth more than six per cent a year, it is economically unsound for them to purchase equipment for cash, when a rental plan with option to purchase is available. As there is no chattel mortgage involved in such a transaction, the plan offers all the financial advantages of retention of capital and unimpaired credit; and further, the rent is paid with a tax-value-dollar.

Leased equipment under the Troy Plan provides the maximum in industrial financing. Mr. Harrigan predicts that a national movement to this plan is essential if we are to maintain our high level of industrial and economic leadership in the world.

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New Canco Oregon Plant

R. C. Stolk, vice president in charge of West Coast operations for American Can Co., and a delegation of company officials broke ground last month for a new container manufacturing plant in Salem, Oregon.

The new plant was termed by Mr. Stolk "a necessary and timely broadening-out of American Can Company's production-base in Oregon." At the same time, he emphasized that the company's present plant in Portland "will remain the principal output source for Canco containers in Oregon."

BULK HANDLING: Shawinigan Resins Corp., Springfield, Mass. has received two of its five tank cars being constructed by American Car and Foundry Industries. The two cars, 8,000 gallon single compartment units (one shown above) will be used to transport "Gelva" polyvinyl acetate emulsions, as will the three cars still to come—an 8,000 gallon two compartment unit and two 8,000 gallon three compartment units.

N.Y.U. Offers Two Paint Technology Courses

New York University, Division of General Education, 3 Washington, Sq., N. is offering two courses in Paint Technology during the spring term. These courses are sponsored by the New York Paint and Varnish Production Club and the New York Paint, Varnish, and Lacquer Association. The courses are:

VT 52—Fundamentals of Paint, Varnish, and Lacquer Technology, Dr. Myron A. Coler and Elias Singer, instructors.

This course is designed for laboratory personnel, sales people, and others desiring a basic fundamental knowledge of coatings solvents, driers, pigments, lacquer materials, etc., with emphasis on the properties that they have and give to different types of coatings. In each group the most important specific types are discussed in some detail. It is then shown how they may be combined in different proportions to formulate the basic trade sales and industrial finishes.

VT 53a—Seminar, New Developments in Organic Finishes, Elias Singer and Sidney Lauren, instructors.

This is an advanced course designed for the experienced paint technician who wants to discuss the latest developments in the field of surface technology. It is run as a seminar with guest specialists and student participation, and changes from term to term as new raw materials and coatings are developed. Among the topics to be discussed are—newest treatments and types of raw materials, latex type finishes, newer types of industrial and polyester coatings, specialty and novelty finishes, and paint headaches and how to cure them.

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7th TAPPI Coating Meet

The Technical Association of the Pulp and Paper Industry Coating Committee will hold its seventh annual Coating Conference May 7-9 at the Benjamin Franklin Hotel, Philadelphia, Pa.

The general subject of the conference will be "Synthetic Adhesives for Paper Coating," and plant trips have been planned for May 10 to the new Du Pont Polychemicals Department Laboratory and the Hercules Experimental Station.

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Sander Lacquer Line

The Monroe Sander Corp., manufacturers of "Sanco" lacquers for industrial finishing, is expanding distribution and making available its industrial proven lacquers through dealers from coast-to-coast, according to Monroe H. Sander, president.

At the same time, he announced that "Sanco" lacquers used by many manufacturers in the finishing of their products, will soon be sold over-the-counter to the consumer and small industrial plants.

NEWS

DeVilbiss Paint Spray School Starts 30th Year

Individualized instruction is the keynote of all courses in the DeVilbiss Company's School of Spray Finishing Technique, now starting its thirtieth year of operation at the firm's main plant in Toledo. Close personal contact with instructors is possible because of the restricted enrollment for each class.

Small classes make for better student-instructor relationship.

Applicants are enrolled for one-week classes. Groups are purposely kept small so that each member of the course is given full opportunity to participate in the series of classroom and laboratory sessions for which a certificate is awarded in recognition of his achievement.

No charge is made by the company for the week of instruction, the only cost to the student being his transportation, room and meals.

Uppermost on the curriculum of modern methods now being covered is a full explanation and operation of the hot spray process of applying materials. Paint heating equipment and full facilities for each student to apply finishes are provided.

Other finishing and coating problems of current importance are thoroughly discussed and classes are often given previews of new materials and equipment necessary for its application.

Applications may be obtained by writing the DeVilbiss Company, 300 Phillips Ave., Toledo 1, Ohio.

Dr. S. D. Douglas, Carbide Scientist, Dies In Texas

Dr. S. D. Douglas, senior scientist in the research department of Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp. died last month in Houston, Texas after a long illness.

Dr. Douglas was one of the foremost research scientists in the field of plastics. Increased production of vinyl resins was made possible by his seventeen years of study and development. His work provided materials for hundreds of peacetime applications and strategic materials in large volume for the wartime manufacture of electrical insulation for wires and cables, coated cloth for military protective coatings, plasticized film for gun covers, rigid sheets for Air Corps instruments, and flexible tubing for aircraft. The use of vinyl resins saved thousands of tons of rubber during World War II.

The nation's most distinguished award for achievement in the plastics industry, the John Wesley Hyatt gold medal, was awarded to Dr. Douglas in 1944 for his outstanding accomplishments. He joined Carbide and Carbon in 1926 and in 1944 was appointed assistant director of research. He was a member of the American Chemical Society, the Society of the Plastics Industry, and the Society of Plastics Engineers.

Hercules Building PE Plant

Construction has been started on the new $6,000,000 pentaerythritol (PE) plant for Hercules Powder Co. at Louisiana, Mo.

The expected completion date is the end of 1956, with a start up of operations scheduled for early in 1957, Joseph B. Talley, works manager for Hercules said. It will have an annual production of 24 million pounds of formaldehyde, a basic raw material for PE.

Pabco to Buy Fibreboard

Pabco Products Inc. has announced that a special stockholder's meeting in San Francisco voted approval for a plan whereby Pabco will acquire complete ownership of Fibreboard Products Inc. through the purchase of that company's stock now owned by Crown Zellerbach Corp.

"Wetting Agents" Seminar Slated by Louisville Club

A seminar on "Wetting Agents" has been scheduled for March 12 by the Louisville Paint and Varnish Production Club. It will be held at the Seelbach Hotel, Louisville, Ky. as part of a two-day meeting, Mar. 11-12.

The seminar is to be a technical discussion by experts both suppliers and paint manufacturers. Registration will take place Sunday, Mar. 11. Scheduled for Monday are three technical sessions—morning, afternoon and evening.

The exact subject of the discussions is being worked out in detail by the technical committee of the Louisville group. Particular interest has been in the "choice of particular wetting agents for particular aspects. The club intends that the discussion be one of fundamental properties of "classes of wetting agents" rather than a discussion of the merits of propriety materials.

Invitations are being sent to the Cincinnati, Indianapolis, Dayton, and St. Louis clubs. All others from surrounding areas are cordially invited.

Discuss Nuclear Energy For Polymerization

A paper on "Polymerization of Monomers and Modifications of Polymers by Ionizing Radiation" was presented at the Feb. 8 meeting of the Vehicle Manufacturers Group of the New York Paint, Varnish & Lacquer Association.

The paper was presented by Prof. Robert B. Mesrobian, assistant director of the Polymer Institute of the Polytechnic Institute of Brooklyn.

Dow Report Optimistic

The Dow Chemical Co., Midland, Mich. predicts that this year will be an even better year for business than was 1955.

In a release entitled, "Review and Outlook" Dow predicts major expansion in certain basic industries which will probably be felt some in 1956 but even more in 1957 because of the inherent lag between planning and construction. Dow itself spent about $50 million for construction in 1955 and expects to spend at least $75 million this year.

NEWS

Paint Technology Course Offered by Rutgers U.

A course in the "Fundamentals of Paint Technology" has been announced by Rutgers University, University Extension Div. Newark Center, 33 Washington St., Newark 2, N.J.

It's designed for those employed in the paint laboratory, plant or business office; for members of the sales forces of both raw materials suppliers and paint manufacturers, and is given in cooperation with the New York Paint and Varnish Production Club and the New York Paint, Varnish and Lacquer Association.

Instructor for the course is William Lawrence, B.S. Chem. Eng., technical director of trade sales finishes, Flood and Conklin Manufacturing Co., Newark, N.J., who has announced the following schedule of guest lecturers and visits to paint laboratories:

March 14—Benjamin Farber, president, Farnow, Inc., Long Island City N. Y., on the "Composition, Manufacture and Uses of Varnishes and Alkyd Resins."

March 21—Robert Ullrich, technical service, Hercules Powder Co., Wilmington, Del., on "Lacquers."

March 28—Edward J. Dunn, Jr., department head of the research laboratory in physical measurements, National Lead Co., Brooklyn, N. Y., on the "manufacture and Uses of White Pigments."

April 18—Charles Gardner, sales manager, Drier Division, Whitco Chemical Corp., New York City, on "Driers and Surface Active Agents."

May 16—Benjamin Chatzinoff, technical director, Twentieth Century Paint Co., on "Relating Products to Sales."

May 2—Visit to the laboratory facilities of Shell Chemical Co., Union, N. J.

May 9—Visit to the laboratory facilities of Resin Research, Inc., Newark, N. J.

Announce Plans For Third West Coast Symposium

Dan Heisler

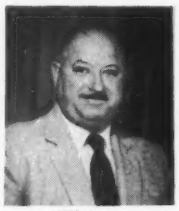
The Third Biennial Symposium of the Pacific Coast Paint and Varnish Production Clubs and the Paint Material and Equipment Show will be held at the Statler Hotel, Los Angeles, Mar. 22-24.

Dan Heisler has been named general chairman and will be assisted by the following committee chairmen: Al Scotland and Earl Hanson—show and exhibit; Joe Weber and J. B. Callaway—symposium program; Henry Melvin—registration, Robert Vignolo—entertainment, Knox Price—publicity.

The 85 booth Exhibit will feature the latest in raw materials, methods and machinery.

Hanson

Melvin



Weber

Scotland

Price

Vignolo

Color Developments Feature of PDCA Meeting

A dramatic presentation of new developments in color treatments for design and decoration, entitled "This is Color: Developments of Color Coordination in Home and Industry," has been scheduled for the opening day session of the 72 Annual National Convention of the Painting & Decorating Contractors of America, to be held Feb. 21-24 at the Sheraton-Park Hotel, Washington, D.C. The color program is being coordinated by the Martin-Senour Co.

Announcement of convention plans was made by William Gelfan, president of the national association. Planning was completed through the joint efforts of President Gelfan, Vice President Ray Elvart, and Assistant to the PDCA President Edward S. Torrence. The PDCA has a membership of 8,500 painting contractors throughout the country, and is the official voice of an approximately three billion dollar industry.

Featured guest speaker will be Senator Wayne Morse of Oregon. Other highlights of the convention program are: An exhibit of a model paint factory, complete in every detail. It will be prepared for the convention by the National Paint, Varnish & Lacquer Association as directed by its President, Joseph Battley, as an educational scientific display; speakers representing labor, manufacturers, materials distributors, wallpaper industry, and architects, each of whom will detail the progress of his profession or industry into the future under the general theme, "Horizons of Progress: Projections of the Future"; also a panel discussion on "New Materials on Display" which will include speakers representing manufacturers and retail distributors.

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Reichold Report

Keeping pace with the all time record set by the plastics and synthetic resins industry in 1955, Reichhold Chemicals, Inc., opened one new plant and bought a site on which it is now building another, said Herbert W. Mason, Jr., administrative vice president, in a year-end statement.

While the industry's history making 1955 output of three and a half billion pounds—35% over 1954—was huge, the figure will be at least equalled and very likely exceeded in 1956, Mr. Mason optimistically prophesied.

Tailor-Made Package Service by Continental is bright, cheerful and obliging

Here at Continental, we've developed a special formula for keeping paint can customers happy. First, we offer containers that never let you down. Continental's exclusive "Tripletite" lid protects your paint by binding to metal at three points. Next, we deliver all the precision-made cans you need, at any time and place you set. And when you require engineering or research help, it's available in just the type and amount to fit your needs. Won't you try Continental's Tailor-Made Package Service? It's as fresh and cheerful as a new coat of paint.

"TRIPLETITE" lid binds metal to metal at three points — provides 50% increase in guard points against oxidation and messy paint skin.

CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4

TAILOR-MADE PACKAGE SERVICE

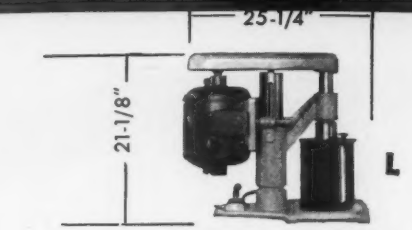
"KADY DEEDS"

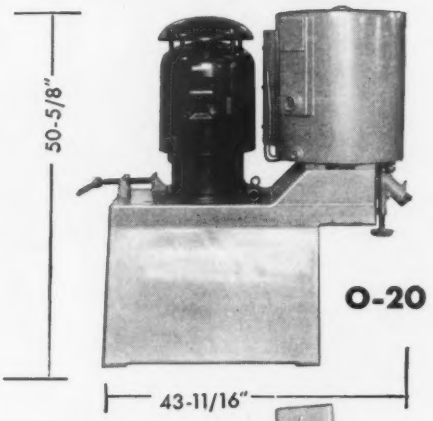
Prove the Value of Kady Mill Performance

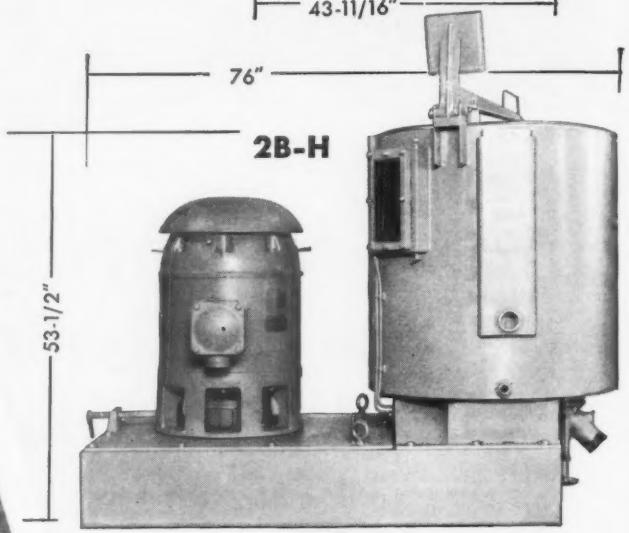
These photographs show the installation of Kady Mills Model 020 and 2-BH40 at the plant of the Warren Paint & Color Company, Nashville, Tenn. Mr. L. D. Warren, plant superintendent, says:

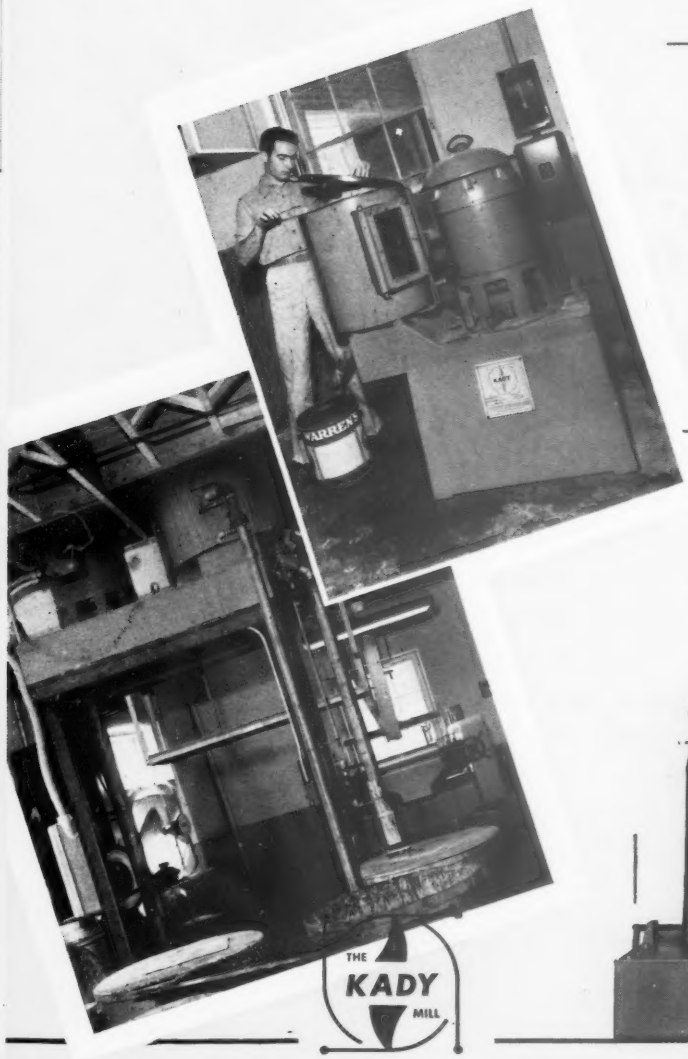
> "Our experience with our first Kady Mill was so satisfactory that within one week we decided that we could not afford to be without the second. Now, after six months, our only regret is not buying both mills earlier."

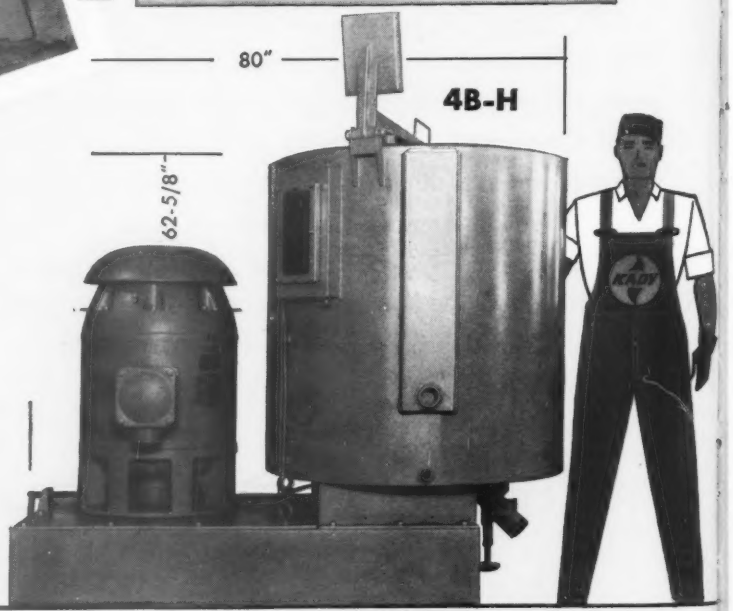
Warren Paint & Color Company manufacture a complete line of quality paints and enamels, from flat wall paints to baking enamels.











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in formulating heat-resistant aluminum enamels for protecting metal work at high temperatures

Marbon "9200" is the perfect answer for the manufacture of high heat resistant aluminum enamels at a low manufacturing cost. Your aluminum enamels will have can stability, excellent leafing and rapid dry, for protecting metal work at temperatures up to 1000 degrees Fahrenheit. Easily applied to furnaces, stacks, mufflers, heat-exchangers, boilers, etc.

MARBON "9200" HV
for low vehicle solids at higher viscosity

MARBON "9200" MV & LV
for general use

MARBON "9200" LLV
for high vehicle solids at lower viscosity

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MARBON . . . Your Buy-Word for Product Perfection

Look to BAKELITE for the stars of '56

to team up with these stars of '55

LATEX WC-130 WC-130, a BAKELITE Brand vinyl acetate resin latex was highlighted as a superior vehicle for interior wall sealers and coatings. It is a smooth, stable, fast-filming aqueous dispersion. It features marked resistance to foaming and unusual electrolytic tolerance. Paints and coatings based on WC-130 provide superior color, toughness, and resistance to alkalis and cleaning compounds.

"COLD-MIX" VARNISHES Definitely a high spot of the year was the enthusiastic acceptance of the "cold-mix" method for preparing durable floor varnishes, exteriors, primers and enamels, primer vehicles for magnesium and aluminum, spar varnishes, baking primers and enamel vehicles, and for upgrading alkyd and ester gum and modified phenol varnishes. This exclusive method is based on BAKELITE Brand Phenolic Resin BR-9400. Cold-Mix coatings show exceptionally fast surface dry, through dry, and produce hard, resistant films. They offer formulators top quality with the greatest possible formulation flexibility with a minimum inventory.

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation*

UCC

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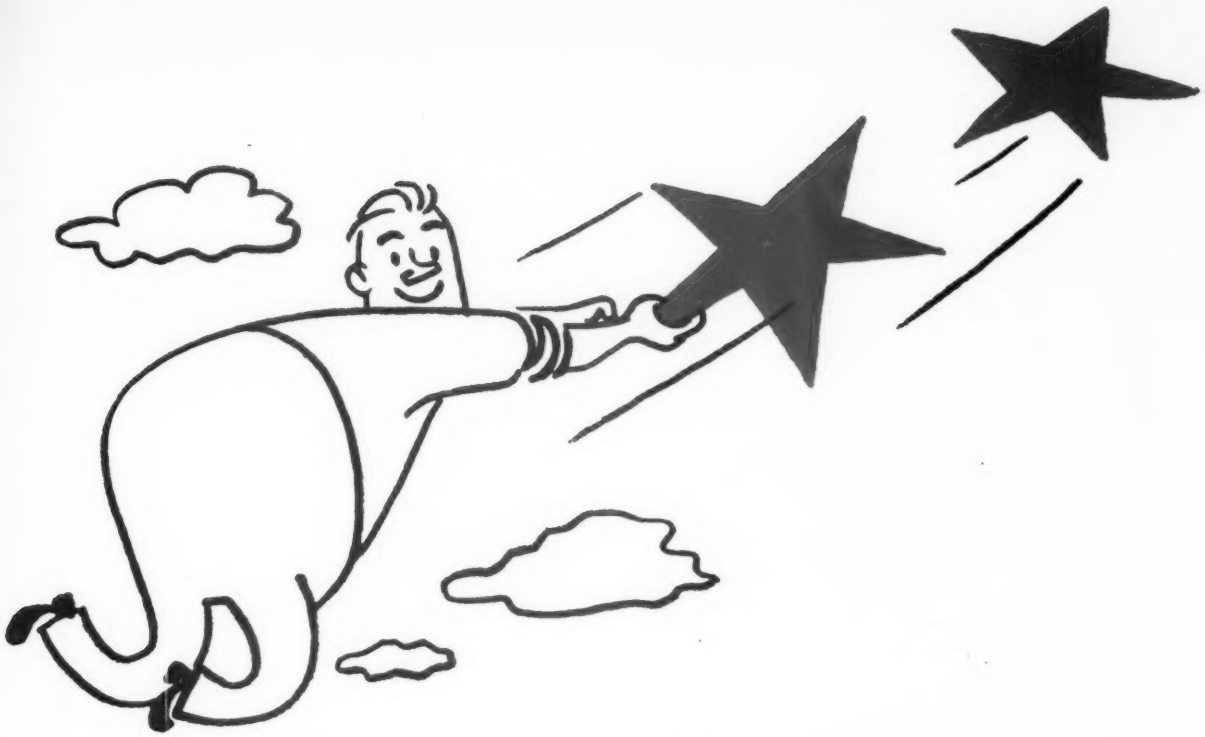

But more than these: In 1955, BAKELITE introduced UF-1952 wall sealer based on WC-130 . . . highly intriguing test data on the use of these latex-based paints for exterior use . . . new data on hot spray techniques . . . simplified production of latex paints by post-plasticization . . . and other valuable contributions. And there are more to come in 1956. For your information and assistance, there are many Technical Bulletins that provide helpful data and formulations. Write for them to Dept. MZ-153.

Look to BAKELITE for the newest and latest in '56

BAKELITE
BRAND
RESINS for COATINGS

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NEWS

Paints To Eliminate Car Waxing Claimed by DuPont

Two automobile paints that eliminate car waxing for at least 18 months under normal conditions of service have been developed by Du Pont chemists, and are being used to a limited extent by several car manufacturers on 1956 models, according to a release from Du Pont.

Trademarked "Lucite" and "Dulux 100," the new finishes have been thoroughly tested on experimental cars during the last two years. Exposure tests under Florida conditions as well as road tests throughout the country are said to have established that the new finishes retain their luster three times longer than conventional car paints. Both are claimed to hold color and gloss so well that waxing will be all but abolished for most new car owners, once the paints are in general use. Conventional washing from time to time will remove road film and restore the original luster.

"Dulux 100" synthetic resin enamel is now in production at Du Pont's Philadelphia, Toledo, and San Francisco plants. Several other of the firm's eight paint plants are expected soon to start manufacture.

According to Du Pont, "Dulux 100" offers the automobile manufacturer outstanding application advantages. It comes out of the baking oven as hard as enamels in current use become after several months' aging. Not only is marring and scratching minimized on the production line, but the new paint also provides outstanding over-bake discoloration resistance. "Dulux 100" synthetic resin enamel can be held at 275° F. for as long as three hours without appreciable color change.

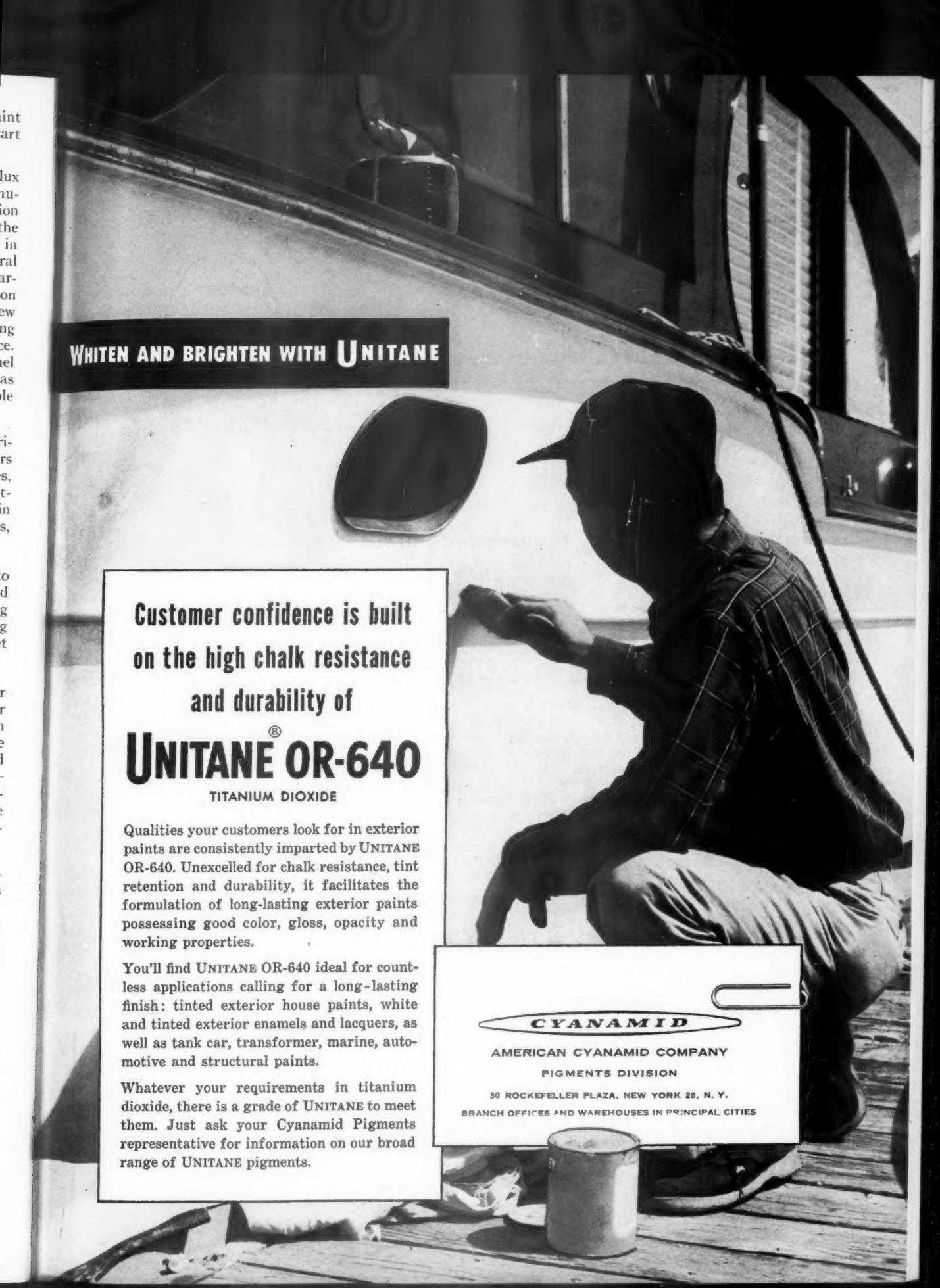
With today's two-tone and tri-color styling requiring that cars go through ovens several times, color change resulting from multiple bakes is a major problem in the matching of hoods, fenders, and bodies.

Moreover, "Dulux 100", said to be highly blister-resistant, should go a long way toward eliminating blistering problems which have long been a source of complaint in wet climates.

Since "Lucite" acrylic lacquer will require a multi-million dollar plant investment to produce in volume, it is presently available to car manufacturers on a limited scale only. The new lacquer—fundamentally different from present finishes—is based on the same chemicals as the familiar, glass-clear "Lucite" acrylic resin.

In addition to ease of maintenance, the new lacquer makes possible dramatic new "glamour" colors and color effects, according to Du Pont. These are achieved by blending metallic powder and pigment in combinations never before successfully incorporated in auto paints. Reflection of light from the metallic particles imbedded in the coating as viewed from various angles imparts a striking depth of hue and range of color.

Road tests are also said to have indicated that both "Lucite" acrylic lacquer and "Dulux 100" synthetic resin enamel will greatly reduce the car owner's trouble from oil or grease staining.


WHITEN AND BRIGHTEN WITH UNITANE
Customer confidence is built on the high chalk resistance and durability of
UNITANE® OR-640
TITANIUM DIOXIDE
Qualities your customers look for in exterior paints are consistently imparted by UNITANE OR-640. Unexcelled for chalk resistance, tint retention and durability, it facilitates the formulation of long-lasting exterior paints possessing good color, gloss, opacity and working properties.
You'll find UNITANE OR-640 ideal for countless applications calling for a long-lasting finish: tinted exterior house paints, white and tinted exterior enamels and lacquers, as well as tank car, transformer, marine, automotive and structural paints.
Whatever your requirements in titanium dioxide, there is a grade of UNITANE to meet them. Just ask your Cyanamid Pigments representative for information on our broad range of UNITANE pigments.
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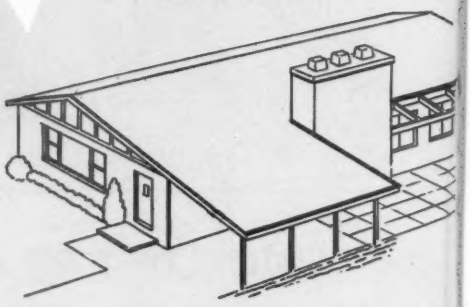
BRANCH OFFICES AND WAREHOUSES IN PRINCIPAL CITIES

. . . for all Aqueous paints

PROTECTION

—against bacterial spoilage in the container



—against mildew attack on the applied paint

NUODEX PMA-15 newest in a line of famous fungicides

As a companion product for Super Ad-It®, leading mildewcide for oil, alkyd and oleoresinous finishes—Nuodex offers PMA-15 for aqueous systems.

Nuodex PMA-15 is a solubilized form of phenyl mercury acetate (25-25.5% concentration) containing 15-15.3% mercury as metal. Developed specifically for water-based interior and exterior finishes, it is economical and easy to use.

Nuodex PMA-15 may be used with a minimum of side effects on the finished paint.

Both laboratory and field experiences show that it . . . does not contribute to staining . . . will not cause pigment flocculation . . . has little or no effect on freeze-thaw stability (in some cases, resistance to freeze-thaw breakdown has been improved by Nuodex PMA-15) . . . does not cause latex coagulation when added to the paint.

Nuodex PMA-15 may be used in any of the standard aqueous systems, including butadiene styrene, polyvinyl acetate, and acrylic types.

We invite you to contact your Nuodex Representative —or to write us direct—for working samples and further data.

NUODEX

NUODEX PRODUCTS CO., INC., Elizabeth, N. J.

Plants in Elizabeth, N. J., Newark, N. J., Long Beach, Calif., and throughout the world

A SUBSIDIARY OF HEYDEN CHEMICAL CORPORATION

NUODEX ADDITIVES TO HELP MAKE GOOD PAINTS BETTER

DRIERS
Naphthenates, Nuolates® (tallates), Octoates

FUNGICIDES
Copper and Zinc Naphthenates
Super Ad-It® (Di [phenyl mercury] dodecenyl succinate)
PMN 10 (Phenyl mercury naphthenate)
PMO 10 (Phenyl mercury oleate)

MIXING AND MILLING AIDS
Nuade®—for roller milling
Nuomix®—for paste mixing
Nuosperse® 657—for wetting, dispersing, anti-settling

LOSS OF DRY INHIBITORS
Nuact® Paste
Cobalt 254

BODYING AGENTS
Nuogel® A. O. (Aluminum Octoate)
Nuvis®—1 and Nuvis—2

ANTI-SKINNING AGENTS
Exkin® No. 1 and Exkin No. 2 for standard oil and alkyd paints
Exkin No. 3 for odorless systems

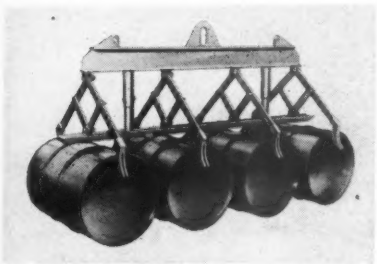
LATEX ADDITIVES
Cyclodex®—to accelerate curing, improve adhesion

STEARATES
Standard and Special Purpose Stearates

NEW MATERIALS & EQUIPMENT

A MONTHLY MARKET SURVEY

This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.



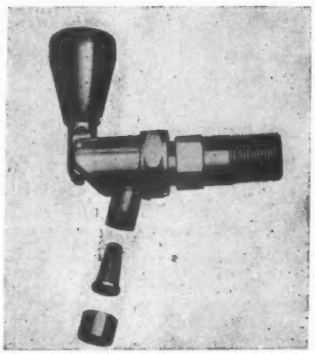
DOWNS

DRUM LIFTER
Horizontal Type

The automatic grab on the Downs Horizontal Drum Lifter is claimed to handle from three to six drums with each lift, making the handling and storing of drums a fast, easy job. Company says that since one hoist operator can handle the whole job, no extra helpers are needed. Downs Crane & Hoist Co., 540 W. Vernon Ave., Los Angeles 37, Cal.

LEAD DRIER
Rosin Free

"Moligned Lead," is said to be an entirely new type of lead drier that is claimed will fill the need not only for a low cost, pale, rosin-free drier but also eliminate much of the loss-of-drying trouble now prevalent in the industry. According to the company, this last feature is due to the fact that the molecules of the lead compound in the drier are not only pre-aligned in the compound but also become permanently aligned in the solute only and hence cannot be inactivated by adsorption at the pigment-vehicle interface. H. M. Johnson, Inc., 12 S. Front St., Elizabeth, N. J.



ECONOMY

STAINLESS STEEL FAUCET
For Volatile, Inflammable Solvents

A stainless steel faucet with a protective, corrosion resistant anti-flash screen in the nozzle has been designed for use with volatile and inflammable solvents or other hazardous fluids. Faucet is manufactured in 304 stainless steel throughout, with chemically inert Kel-F seal rings.

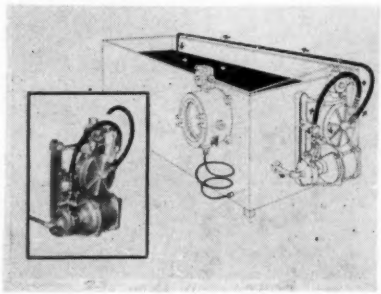
The fume-tight, sanitary faucet is said to permit full flow and have automatic, positive shut-off action which prevents after-drip. Shank is supplied in interchangeable sizes of $\frac{3}{8}$", $\frac{3}{4}$" and $\frac{1}{2}$" with tapered threads to allow a tight fit in bung threads of dispensing drums. Economy Faucet Co., 12 New York Ave., Newark 1, N. J.

STEEL DRUMS
With Protective Surface

Four of the company's container plants are now producing steel drums with a conditioned protective surface. This process, called "JaLizing," is said to produce a drum which has chemically clean, grease-free surface inside as well as out; a corrosion-inhibiting surface which prevents the creeping of rust; a non-conducting bond between bare metal and paint; and a thoroughly clean surface. Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.

VISCOSITY CONTROL UNIT
For Dip Tanks

The "Visco Dip" controller is said to maintain dip tank temperature within a plus or minus of one degree, thus holding constant viscosity and automatically compensating for plant temperature change and paint consumption. This control speeds production flow, cuts rejects, and minimizes operator attention according to the company.



SPEED-FLO

Unit combines a U.L. approved, explosion-proof Spee-Flo heater and a precision liquid temperature controller. The paint is circulated out of the tank through the heater and returned into the tank beneath the liquid level. The precision controller actuates the heating unit and maintains the paint at a predetermined temperature.

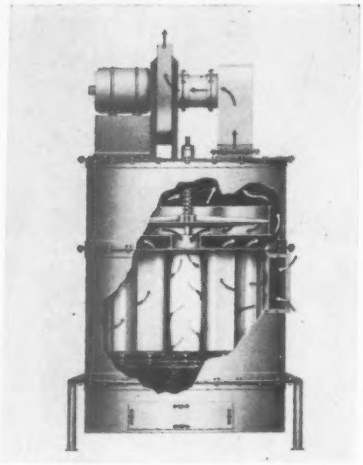
Available in two models, the "300" and "600" series, units are designed to control dip tanks of up to 200 and 600 gallons respectively, at a selected temperature level of 70 to 100 degrees F. Speed-Flo Co. 720 Polk Ave., Houston, Texas.

HAND TRUCK
With Pneumatic Tires

The "Lite-N-Tuff" lightweight hand truck, equipped with pneumatic tires, has been specially designed to reduce the effects of load jar on fragile cargo when moving over rough ground, jumping curbs, etc. The pneumatic tires are said

to cushion the shock of impact, and also give added protection to floors and floor coverings.

Trucks are capacity rated to carry 400 pounds, and are available in single and double-handle models. Other features claimed include: welded-steel tubular construction; concave steel cross-straps; stair climbers; roller bearing wheels; red enamel finish; rubber handle grips. Tire sizes offered are 8 x 3.00-4 and 10 x 3.50-4; 4 ply casings with inner tubes. The Hamilton Caster & Mfg. Co., 1700 Dixie Highway, Hamilton, Ohio.



DAY CO.

DUST FILTER UNIT

Automatic Type

The "Day Type RJ" dust filter is said to have a unique design which makes possible a highly efficient, automatic continuous, low cost filter. Unit can handle air volumes up to 1200 CFM, according to the company.

Major reason given for the high efficiency (99.99+%, according to manufacturer) of this filter is the fact that it employs the Hersey principle of high velocity air cleaning. The filter differs from the usual Hersey principle in that the dust is deposited on the outside of the filter sleeves. The reverse air for cleaning the twelve filter sleeves surges from an indexing drum through each sleeve individually. The Day Co., 810 Third Ave. N. E., Minneapolis 13, Minn.

DILUENT

Ups KF Reagent

Analysts are said to save hours by titrating electrometrically with Karl Fischer reagent instead of using oven drying for moisture determinations of alcohols, ketones, esters, fats, oils, petroleum fractions, organic acids, and many other materials.

Company says the Fischer Chemical Manufacturing Division's Karl Fischer reagent, claimed to be the laboratory world's first KF reagent offered in a stabilized, single solution, now has a superior diluent that extends its usefulness to the lower titers (about 1 to 3). Shelf life is said to be excellent. No color change is exhibited, and the diluent can be used for visual titrations, according to the company. Fischer Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.

ENAMEL VEHICLE

Low-Odor

New and improved "Metrolin #2" enamel paint vehicle is said to offer excellent initial gloss to enamel paints. Its outstanding characteristics are superior gloss retention and lack of odor, according to the company. Product is also said to handle easily and be compatible with a wide range of oils and resins. Brown-Allen Chemicals, Inc., Dept. 05, P.O. Box 1, Staten Island 2, N. Y.

DOW

For every can of latex paint sold in 1948, 500 will be sold this year

Climb the Dow ladder of powerful spring promotion and get your share of '56 sales

No other paints can match the phenomenal sales growth of latex paints. And '56 promises to be the biggest year of all.

To get your share of '56 sales tie in to the Dow hard-hitting spring promotion. Ads built around the theme *"Why wash those walls? It's so easy to give them fresh new beauty with latex paints."* will appear in 8 leading publications from March through June: BETTER HOMES AND GARDENS, AMERICAN HOME, SATURDAY EVENING POST, HOUSEHOLD, LADIES' HOME JOURNAL, LIVING FOR YOUNG HOMEMAKERS, POPULAR MECHANICS, SUCCESSFUL FARMING. Publicity releases will also be sent to the TV and homemaking editors of 4,800 newspapers and national women's and home magazines.

This is an appealing theme that can be incorporated into your own advertising and promotion . . . and give you extra advertising power. For further information, contact Dow Sales Department PL560L. THE DOW CHEMICAL COMPANY, Midland, Michigan.

LATEX T.M.

you can depend on DOW PLASTICS

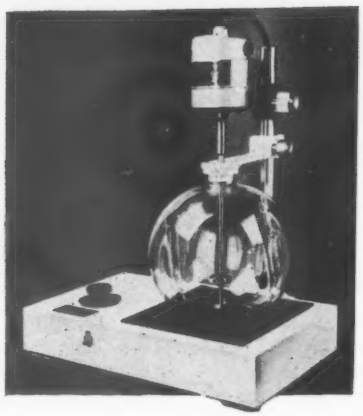
DOW

NEW MATERIALS — EQUIPMENT

LAB HOMOGENIZER
For Rapid Mixing

The "Aero-Seal Chemixer," a counterpart to the company's 23,000 and 45,000 R.P.M. top drive laboratory homogenizers, has been specifically designed for the rapid mixing of chemicals in pilot plant scale procedures.

Driven by a 1/10 H.P., 110 Volt A.C. motor, the mixer produces speeds from 100 to 10,000 R.P.M. and efficiently handles between 100 ml. to 4 liters of materials by utilizing the appropriate container,



MACHLETT

according to the company. Six Pyrex containers of varying capacity—all deep fluted—are available.

Unit utilizes razor sharp 18-8 stainless impellers and is equipped with a specially designed teflon aerosol free cap assembly for containers. Dangerous aerosols are claimed to be contained while mixing and outside impurities are kept out. E. Machlett & Son, 220 E. 23 St., New York 10, N. Y.

ALKYD LINE
Isophthalic Type

Company announces that it is introducing a line of isophthalic alkyds. A pioneer in these new type alkyd resins, the company also manufactures a completely new, low cost, long fish oil isophthalic alkyd said to have excellent characteristics in flexibility, drying and durability. This alkyd is used in light tints for gloss, semi-gloss and primers for interior application, as well as exterior trim and trellis whites and colors. It will complement the company's line of isophthalic alkyds which will be manufactured from other oils. The Menhaden Fish Products Co., 108 E. York St., Baltimore, Md.

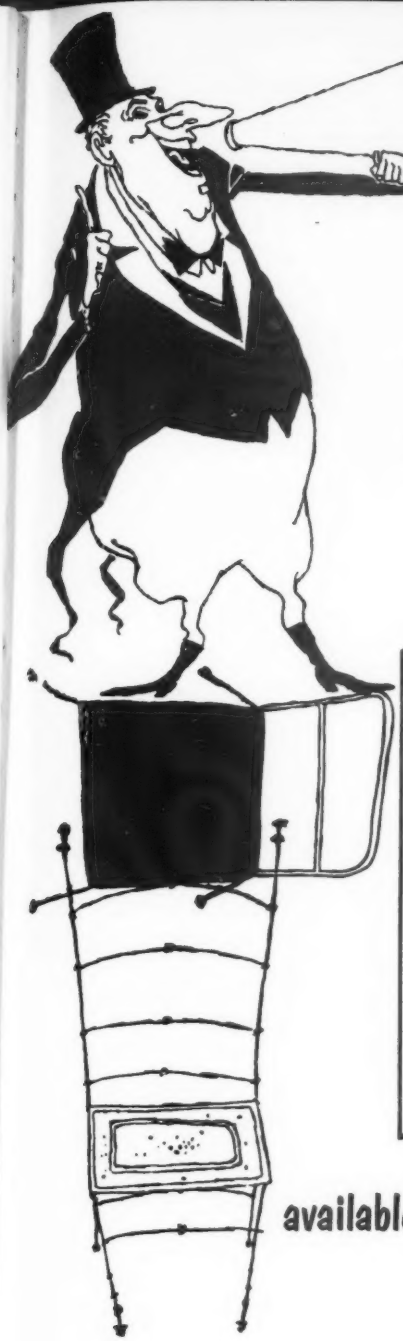
PORTABLE LIFTS
500-2000 Lbs. Capacity

Line of multi-purpose, manually propelled, hand and battery-powered hydraulic lifts with capacities from 500 to 2000 pounds, are said to have a unique design which provides four carriers in one: A platform truck, a straddle fork truck, a portable elevator, and a shop crane.

Exclusive features claimed are: Adjustable legs which allow the carrier's legs to ride straddling the load or beneath the load as required; new design adjustable forks; and remote control as standard equipment at no additional cost on power operated models. Power models also feature a built-in charger and platforms that lower flush to the floor. Oster Manufacturing Co., Box 4326, Cleveland 32, Ohio.

COPPER PHTHALOCYANINE
High Strength

"Cyan Blue Toner GT NF 55-3450" is a new green shade, high-strength copper phthalocyanine blue toner, said to be resistant to



ANNOUNCING PICCOPALE A-1

with TEN big advantages for you

a new cost-reducing modifier for LATEX PAINTS

available in abundant supply

1. ***Improved paint quality*** National paint manufacturers, field-testing Piccopale A-1, convinced themselves that this new modifier definitely improved the quality and reduced the cost of their paints.
2. ***Excellent soil removal*** Soil is readily removed from paints of high pigment volume, made with Piccopale A-1 Emulsion.
3. ***Alkali-resistant*** The low soap-to-resin ratio of Piccopale A-1 Emulsion, plus its hydrocarbon composition, give it outstanding resistance to soap, water and alkalies.
4. ***Compatible*** Piccopale A-1 Emulsion is easy to use, being compatible with protective colloids, thickeners, pigments, modifiers.
5. ***Flexible*** Plasticizing action gives permanent flexibility to styrene-butadiene paint films.
6. ***High Adhesion*** Latex paints modified with Piccopale A-1 have good initial adhesion.
7. ***Water-resistant*** The excellent early water-resistance of Piccopale A-1 modified latex paints is due to the hydrophobic nature of Piccopale. Dried films are unaffected by water.
8. ***Stable*** Package stability is very good, because Piccopale A-1 Emulsion is non-creaming at both 50% and 10% solids.
9. ***Uniform*** The uniformity of Piccopale A-1 Emulsion is enhanced by the small particle size, less than 1.0 micron.
10. ***Low Cost*** The low cost and abundant supply of Piccopale A-1 Emulsion enable you to expand your product lines.

Ask for "Picco Field Service"

Pennsylvania Industrial Chemical Corp.

Clairton, Pennsylvania

Plants at:
Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.

District Sales Offices
Boston, New York, Detroit, Cincinnati, Chicago
Los Angeles, Philadelphia, Pittsburgh

PENNSYLVANIA INDUSTRIAL CHEMICAL CORPORATION — PICCO

Pennsylvania Industrial Chemical Corp.
Clairton, Penna.

Please send me further information on PICCOPALE A-1 EMULSION.

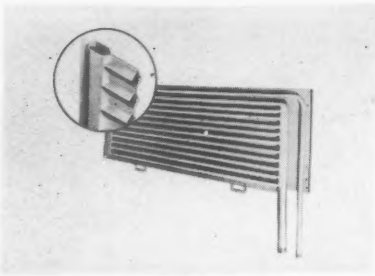
Name_____ Position_____

Company_____

Address_____

flocculation and crystal stable in aromatic hydrocarbon solvents.

Made by a new process, product was developed to provide the formulator of lacquers and enamels with a bright, clean, and strong green shade blue toner. Physically, it is a full strength copper phthalocyanine blue. It has a specific gravity of 1.67, a weight per gallon of 13.9 pounds and a bulking value of 0.0720 gal./lb. Pigments Division, American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.



TRANTER

HEAT TRANSFER UNITS
Higher Pressure Ratings

A 50 per cent increase for two styles of header-type, double-embossed units—"Style 70" and "90" Platecoils—are now offered for use at up to 150 pounds maximum operating pressure. Previous maximum recommended by the manufacturer was 100 pounds. Improved engineering and factory control and fabrication are among the reasons cited by the company for the increase. Company says the increased rating retains the 1 to 4 factor of safety between maximum operating pressure and rupturing pressure. Tranter Manufacturing Inc., Lansing 4, Mich.

THICKENER-STABILIZER
Synthetic Type

New type synthetic thickener-stabilizer for water phase plastic and rubber emulsions, just put into plant production, has acrylic material especially recommended for thickening latex, polyvinyl acetate, and acrylic polymers used in textile, paint and paper processing, according to the company.

Manufacturer says that suspending and stabilizing properties are superior and no buffering is necessary for adjusting viscosity over a wide pH range, also pH and viscosity drifts are eliminated due to the ability of the product to remain stable over extended periods of storage. Wica Chemicals, Inc., Old Concord Rd., Charlotte, N.C.

MONO-PENTAERYTHRITOL
"Zero-Ash" Type

Commercial availability of "zero-ash" mono-pentaerythritol has been announced by the company's Synthetics Department. Said to be the result of extensive modifications in the PE manufacturing process which has been developed by the company, process removes both organic and inorganic impurities from the mono-PE. The inorganic impurities are referred to as the ash content of PE.

Company says the removal of organic impurities increases the pure mono-PE content. Elimination of inorganic impurities makes it easier to obtain uniform properties in the resins and other products made from the new material. These qualities of purity and uniformity are important in the manufacture of core oils, synthetic drying oils, special alkyd resins, and certain types of polyesters. Product is claimed to be "dust free." Hercules Powder Co., Wilmington 99, Del.

PERSONNEL CHANGES

Lukas
VELSICOL

McCormack
NEWPORT

Kingsley
KELLOGG

McCullion
FARNOW

AMERICAN CYANAMID: **Drs. R. Bruce Van Order** and **J. Arndt Weicksel** have been appointed to the new product development department.

GLIDDEN: **C. W. Wright** has been appointed butoxy resin coordinator of the paint division. He will coordinate all sales, laboratory and manufacturing activities in connection with butoxy resins and coating products having a butoxy resin base.

VELSICOL: **Edward B. Lukas** has been promoted to the position of technical service representative. He will headquarter in Chicago, while maintaining close liaison with company plants in Memphis, Tenn. and Marshall, Ill.

NEWPORT INDUSTRIES: **J. H. McCormack** has retired as president and member of the executive committee after 39 years of service with the company and its predecessors. He will remain a member of the board of directors and consultant for the company. His successor is **E. F. Sisson** who has been with the company since 1928. Mr. Sisson has been a director of the company since 1953.

SPENCER KELLOGG and SONS: **Dr. Allan F. Kingsley** has been appointed senior research chemist in the new research center in Cheektowaga, N. Y. He will be responsible for developing analytical methods for the manufacturing control of new products now under investigation there.

FARNOW: **John J. McCullion** has been appointed sales agent for the areas of Philadelphia, Washington, D.C., Baltimore and eastern Pennsylvania. He will headquarter at his own office at 2615 E. Westmoreland St., Philadelphia.

NATIONAL LEAD: **John A. Southworth** has been named manager of the paint division of the Atlantic branch and George Diehlman manager of the pigments and chemical division of the branch . . . **Ralph M. Bennett** becomes manager of the Cleveland branch paint division and **William W. Howard** manager of the pigments and chemicals division of the Cleveland and Cincinnati branches . . . **Edwin C. Hill** has been appointed sales manager, pigments and chemicals division of the Atlanta branch.

GODFREY L. CABOT: **Charles R. Schroth** has been appointed assistant manager and **Frank A. Magno** technical representative of the special blacks division. Mr. Schroth will have charge of sales in the eastern section of the United States with the exception of New England. Mr. Magno will handle technical service for the department in the midwestern area of the United States.

The headache that was nailed to a tree

Fewer years back than you might imagine, our ancestors had the idea that a tree could accommodate them by taking over a headache.

The technique was simple. The sufferer wrapped a lock of his hair around a nail and whacked it into the most convenient timber.

Unitol, the refined tall oil, is a forest product that does a more scientific job of relieving mental strain.

This superior tall oil costs substantially less than the components it replaces. Paint manufacturers like its light color, quick drying characteristics and high viscosities.

Economical Unitol simplifies processing too. Many users have reduced manufacturing costs in addition to their savings on raw materials.

unitol
THE REFINED TALL OIL

Chemical Sales
UNION BAG & PAPER CORPORATION
Woolworth Building, New York 7, N. Y.

Now for house paint formulations

EAGLE-PICHER
414 ZINC OXIDE
LEAD FREE
wets easier, faster!
reduces oil demand!

Now, after years of extensive research and development in the Eagle-Picher laboratories, the new 414 Zinc Oxide has been "fence-tested" and proved on the job. It provides these unique and highly desirable features in your house paint formulations:

- **Reduced oil demand! Saves money!**
- **Increased gloss retention!**
- **Superior mildew resistance!**
- **Improved blister resistance!**
- **Greater film flexibility!**
- **Easier, more uniform brushing qualities.**

AND REMEMBER . . .

Eagle-Picher maintains rigid quality control from ore to finished pigment . . . and as the largest producer of *both* zinc and lead pigments, provides unequalled and unbiased customer service.

Since 1843

EAGLE EP PICHER

THE EAGLE-PICHER COMPANY

Largest Producer of Both Zinc and Lead Pigments

General Offices: Cincinnati 1, Ohio

Regional Sales Offices: Chicago, Cleveland, Dallas, New York, Philadelphia, Pittsburgh

Silverfield
MATHERSON

Drexler
GOODYEAR

Gillen

Triggs
GOODYEAR

Gamble
KINETIC

Thompson
PPG

MATHERSON-SELIG: **Stanley Silverfield** has been appointed to the Sales Department. He will headquarter in Chicago.

GOODYEAR: **John H. Drexler III,** special representative for the chemical division, has been transferred from the Cleveland territory to New York. He will handle "Plio-Tuf" thermoplastic high impact resins, "Pliovic" vinyl resins, and "Chemigum" and "Plioflex" rubbers . . . **Ormond R. Gillen** has been appointed sales service staffman and **F. Joseph Triggs, Jr.** has been appointed sales trainee.

KINETIC DISPERSION: **Gordon W. Gamble** has been elected assistant treasurer and office manager.

PITTSBURGH PLATE GLASS: **Joseph C. Thompson, Jr.** has been appointed to the newly created position of general manager of trade sales finishes of the paint and brush division.

BAKER CASTOR OIL: **John V. Reilly** and **Martin H. Smith** have been appointed sales representatives working out of the New York office. Mr. Reilly will service the New York State area, excepting Staten Island and Long Island. Mr. Smith has been assigned the Brooklyn-Queens-Long Island territory.

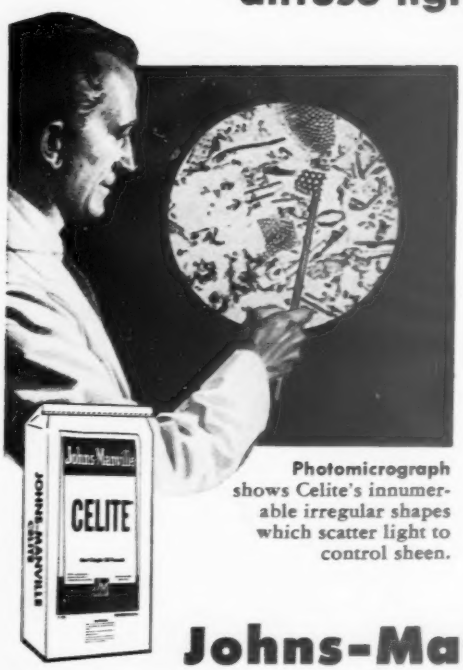
SHERWIN-WILLIAMS: **Vincent L. Sahli** has been appointed technical representative in the Toledo-Detroit-northeastern Michigan area for the Pigment, Color and Chemical Division. His headquarters will be in the Detroit office.

DEVOE & RAYNOLDS: **William C. Dabney, Jr.** has been appointed manager of the newly formed west central district. His jurisdiction will include the Rocky Mountain area and the north central states and he will headquarter in Denver . . . **John A. Sixta** has been made assistant district manager.

NAFTONE: Sales in the Chicago territory will be handled by the **Donald R. Fitzgerald Co.,** 1005 Belmont Ave., Chicago 13, Ill., the Minneapolis-St. Paul and Northern Wisconsin area will be covered by the **Hawkins Chemical Co.,** 3100 E. Hennepin Ave., Minneapolis 13, Minn.

CHARLES HARDY: **F. H. Mulligan** has been elected president of the company succeeding **John D. Dale,** who was elected chairman of the board of directors. The new president has been vice president and a director, and before that served as secretary of the company.

CELITE diatomite pigments diffuse light and control reflection



Photomicrograph shows Celite's innumerable irregular shapes which scatter light to control sheen.

A soft uniform flatness, even at low angles, is the beautiful result of formulating interior paints with Celite*. By forming a rich textured film that diffuses rather than reflects light, these microscopic particles assure an attractive flat appearance indefinitely. The surface never rubs up shiny. These same irregular particles also impart "tooth" to the film for strong, lasting adhesion to any surface.

Celite is diatomite, an extremely tough form of amorphous silica, that reinforces the paint film. And, the micro-porosity imparted by Celite checks blistering and peeling by aiding the escape of moisture vapor from unpainted plaster.

If you're concerned about low angle sheen, find out how Celite can give you complete control of this problem. Write for further information to Johns-Manville, Box 60, New York 16, N. Y. In Canada, 565 Lakeshore Rd. E., Port Credit, Ont.

JOHNS-MANVILLE JM PRODUCTS

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products

Johns-Manville CELITE THE EXTENDER PIGMENTS FOR ALL COATINGS

Dillon

Eberman

A-D-M

Berry

A-D-M

Krashin

COLTON CHEMICAL

Eisenhart

Pistell

NATIONAL GYPSUM

ARCHER-DANIELS-MIDLAND: Hall S. Dillon has been appointed regional sales manager succeeding **Fred H. Eberman, Sr.** who plans to retire after 52 years in the protective coatings industry. In his new position Dillon will have charge of the sale of drying oils, paint vehicles, resins, and vegetable fatty acids in the Cleveland, Buffalo, Pittsburgh and Detroit markets. He will headquarter at the Cleveland office. **Gerald Berry** has been appointed Cleveland sales manager for drying oils, paint vehicles, resins, and vegetable fatty acids.

COLTON CHEMICAL; Bernard R. Krashin has been appointed president of the Colton Chemical Co. division of Air Reduction Co. He succeeds **H. Seymour Colton** who resigned.

NATIONAL GYPSUM: Elwood W. Eisenhart has been appointed paint supervisor for the midwest sales division with headquarters in Chicago . . . **Robert K. Pistell** has been selected for a similar position in the central sales division with headquarters in Buffalo.

NATIONAL BUREAU OF STANDARDS: Robert S. Walleigh has rejoined the staff as assistant director for administration. He will serve as the director's principal staff advisor on management matters, and supervise the operation of the administrative divisions that support the Bureau's technical program.

GELVATEX COATINGS: George O. Morrison has been elected president of the company . . . **Larry Blodgett** will head the sales department.

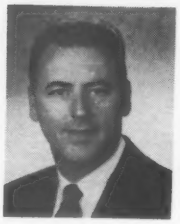
SINCLAIR CHEMICALS: John A. Corrigan has been appointed district sales manager and will manage chemical marketing activities in the midwest with headquarters in Chicago . . . **Anton M. Horehled** has been appointed manager of nitrogen product sales to direct sales of anhydrous ammonia and nitrogen solutions from the Calumet Nitrogen Products Plant at Hammond, Ind.

COMMERCIAL SOLVENTS: Raymond M. Coveney has been named manager of the Boston sales district of the industrial chemicals department. He will direct sales operations in the New England states, and will headquarter in Boston.

ACME QUALITY PAINTS: L. J. O'Doherty has been appointed manager and will be in charge of automotive and trade sales operations in the Pacific Coast district. This encompasses most of the eleven western states, Hawaii and Alaska.

Beggs
NAT'L STARCH

Laganis
SCHENEC'Y



Clark
CABOT

Shankweiler
HERCULES

NATIONAL STARCH: John D. Beggs has been appointed to direct the sales of vinyl resins to the paint and other protective coatings industries. He will also coordinate the company's resin sales efforts to the adhesive manufacturing and related chemical specialty fields.

SCHENECTADY VARNISH: Deno Laganis has been appointed to the research and development staff of the resins division. He will concentrate on specialty polyesters.

GODFREY L. CABOT: Francis J. Clark has been appointed salesman in the New Jersey-Philadelphia area.

HERCULES POWDER: Fred K. Shankweiler has been appointed to the newly created post of sales manager, coating materials, for the cellulose products department . . . **James R. Yeager,** who has been manager of market development on coatings, has been named manager, nitrocellulose sales, succeeding **Harmer Rile,** retired after 38 years of service to the company . . . **Robert D. Ullrich,** senior technical representative in the New York office for cellulose products, will supervise chlorinated products sales, also a unit of the new coatings division. He has been transferred to the home office in Wilmington to assume his new post. **Harry F. Ahern,** manager of the Mansfield, Mass. plant, has been appointed assistant director of operations of the synthetics department and has been transferred to Wilmington . . . **John Z. Miller,** technical assistant to the director of operations has been appointed to the newly established post of manager of engineering . . . **Harold R. Monfort** becomes plant manager at Manfield. New posts for three members of the administrative sales personnel of the paper makers chemical department, Atlanta, district sales office are as follows: **Louis A. "Tommy" Thompson** to the newly created position of special representative, southern district . . . **J. Huston McClane,** manager, southern sales district . . . **William E. Hamilton,** assistant manager, in charge of the New Orleans sales office. **David R. Wiggam,** manager of Development for the cellulose products department, will retire at the end of this year. **Donald H. Sheffield** has been named assistant general manager of the synthetics department . . . **Dr. R. Stanley George** has been named manager of the oxychemicals division of the naval stores department . . . **Paul L. Johnstone** was named director of development for the cellulose products department . . . **Dr. Harvey J. Taufen** was named director of development for the synthetics department . . . **C. D. Ender** becomes director of development for naval stores . . . **Dr. R. W. Ivett** has been named manager of the associated research divisions, Hercules' experiment station . . . **Dr. Ernest Turk** becomes manager of the naval stores research division . . . **Dr. Alfred A. Albert** named manager of the synthetic research division.

SHERWIN-WILLIAMS: David W. Drummond has been named southwestern regional director, succeeding the late A. W. Everett. He will make his headquarters in Kansas City, Mo.

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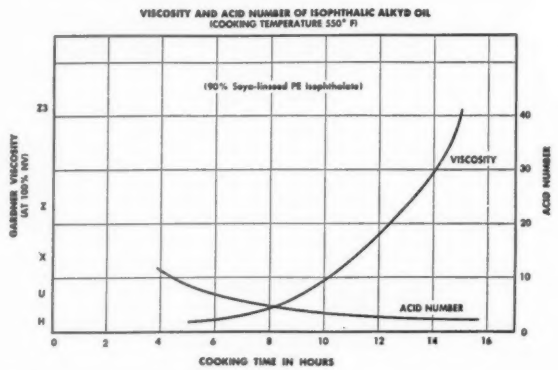

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Carew Tower, Cincinnati 2, Ohio
714 W. Olympic Blvd., Los Angeles 15, Calif.
20 North Wacker Drive, Chicago 6, Illinois
Mercantile Securities Bldg., Dallas 1, Texas

3609

Morand
DOW

Oldshue
MIXING

DOW CHEMICAL: M. H. P. Morand has been advanced to the post of manager of coatings sales, succeeding **Floyd J. Gunn** who has become manager of the Los Angeles office.

MIXING EQUIPMENT: Dr. James Y. Oldshue has been advanced to the position of director of research.

C.K. WILLIAMS: E. H. Green has been appointed to the newly created position of executive vice president, and will also serve as chairman of the exectuive committee . . . **E. H. Kroepel** becomes general sales manager . . . **S. E. Richards** becomes eastern division sales manager . . . **T. J. Stewart** has been promoted to works manager of all plants . . . **A. T. Pickens** becomes works manager at East St. Louis. The board of directors has named the following to serve on the executive committee: **E. H. Green,** chairman, **J. W. Ayers, L. K. Ayers, W. N. Crumpler, R. W. Dodson, E. H. Kroepel, J. W. Schlosser, R. A. Stephens, T. J. Steward,** and **M. R. Williams.**

CARBIDE and CARBON: W. M. Anderson has been appointed district manager in New York. He is replaced as district manager in Cleveland by **J. K. Marshall,** formerly acting district manager in New York . . . **A. P. Moss** has been made industrial chemicals production manager in New York . . . **Max Hill** has been appointed fine chemicals production manager in New York . . . **W. W. TenEyck** becomes superintendent of chemicals and resins in the South Charleston, W. Va. plant . . . Other changes in the research department include: **Dr. W. N. Stoops** appointed associate director; **Dr. H. C. Chitwood, B. J. Cottrell, Dr. Benjamin Phillips, G. M. Powell,** and **A. T. Walter** appointed assistant directors; **Dr. D. M. Young** has been appointed assistant to the director and will be located in New York.

GREAT WESTERN PAINT: Richard B. Peters has been appointed trade sales manager. Formerly Chicago branch manager, Mr. Peters will now headquarter in Kansas City.

Koppers Co. To Invest $25 Million In 1956

Koppers Company, Inc. will invest approximately $25,000,000 this year to continue a five-year expansion program launched in 1955, according to Fred C. Foy, president.

Investments during the year will be made through acquisition, in the expansion and improvement of existing facilities, and in the construction of new plants, he asserted.

Approximately $25,000,000 was invested by Koppers in 1955 in acquiring six different companies, in expanding and improving existing plants and for addition of new plant facilities.

Discuss Jelled Paints

The Rocky Mountain Paint and Varnish Production Club heard the complete story of jelled paints at a recent meeting.

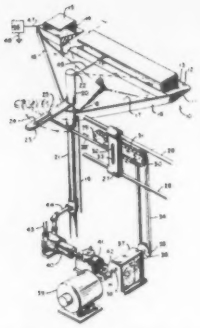
Nick G. Contos, technical director of T. F. Washburn Co., Chicago, manufacturers of polyamide gel vehicles, explained the formulation of jelled paints, their significance to manufacturers developing this new type product and their advantages market-wise. In discussing the unique features of this paint for improving product appeal, Mr. Contos emphasized the especially strong sales possibilities to the "do-it-yourself" market.

PATENTS

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired (to foreign countries $1.00 per copy) to the publisher.

Spray Coating of Vehicles

U. S. Patent 2,728,689. Edwin M. Ransburg, Indianapolis, Ind., assignor to Ransburgh Electro-Coating Corp., a corporation of Indiana.

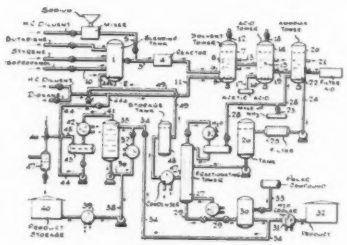


U. S. Patent 2, 728, 689

The method of coating an article which comprises providing a member terminating in an elongated edge, ejecting a jet stream of coating material from a source, providing a surface vertically spaced above and substantially co-extensive with the edge, oscillating the source to cause the jet stream to traverse said surface for gravity flow therefrom to said edge, atomizing coating material from said edge, electrostatically charging the atomized particles and electrostatically dispersing said particles and depositing them on the article being sufficient to permit substantial dispersion of the particles as they move toward the article under the influence of said electrostatic charge.

Hydrocarbon Drying Oil

U. S. Patent 2,728,801. Stanley E. Jaros, Rahway, Anthony H. Gleason, Westfield, and Robert F. Leary, Cranford, N. J., assignors to Esso Research and Engineering Company, a corporation of Delaware.



U. S. Patent 2, 728, 801

A continuous process for producing a hydrocarbon drying oil which comprises mixing 75 to 85 parts of butadiene, 25 to 15 parts of styrene, 200 to 300 parts of straight-run mineral spirits boiling between about 150 and 200° C., 10 to 35 parts of p-dioxane, 1 to 3 parts of finely dispersed sodium metal and 10 to 20% of isopropyl alcohol based on the weight of sodium, heating the mixture to a reaction temperature between 65 and 95° C. and continuously passing the heated mixture through a narrow tubular zone to activate the mixture, the length of the tubular zone being such that passage of the mixture therethrough takes about 5 to 30 minutes, thereafter agitating the mixture in a closed polymerization tank at reaction temperature until a monomer conversion of at least 65% is reached, and continuously withdrawing the partially polymerized mixture in linear flow through a second tubular zone maintained at reaction temperature, the length of said second tubular zone being such that complete conversion of monomers is obtained on passage therethrough.

Wood Stains With A Flavanone Azo Dye

U.S. Patent 2,723,899 . . Harry A. Toulmin, Jr., Dayton, Ohio, assignor to Chadeloid Corporation, Dayton, Ohio.

A wood staining composition com-

FINER FINISHES
(*From page 29*)

result obtained with the high film build thinner unless such a thinner is used as the solvent in the base material. Incidentally, the high film build formula may be used as a solvent for the basic components of a lacquer as well as a thinner,

ITEMS	Formulae, % by Volume		
	1	2	3
Aliphatic Nap. 90-135 C	40	60	60
Aliphatic Nap. 150-200 C	20	-	-
Aromatic Nap. 140-180 C	20	20	20
Xylene	10	20	10
Toluene	10	-	-
Butyl Alcohol	-	-	7
Cellosolve	-	-	3
	100	100	100

Figure 6. Formulae for enamel solvents

A spray man using 18 passes of the gun to paint an 18″ x 36″ sheet of metal with a maximum film of 0.5 mil before sagging, was able, without practice, to apply 1.0 mil in six passes with no trace of sagging and without changing line speed.

The High Film Build formulation also makes more practical the use of automatic spray machines for vertical surfaces. As with hand spraying, distance from gun to work, and the line speed, each have a tendency to prevent the maximum advantages being reaped in the way of smooth and lustrous films.

Hot Lacquer Spraying, Steam Spraying, and Airless Atomization are all means of obtaining higher film builds with a minimum number of coats and a minimum volume of thinner. In all cases, the higher solids at the work provides better filling of depressions due to a reduced shrinkage percentage on drying, and without danger of sagging. None of these methods will produce the quality of the and the maximum film build thus attained in one coat. The temperatures required with Hot Lacquer, and Steam Spraying, and the pressure and temperature required with Airless Atomization, must be taken into consideration from both the cost and hazard standpoints in evaluating them against High Film Build Thinner.

The High Film Build Theory was first applied to enamels. This was done by changing the thinner, but it soon became clear that for a significant result, the solvents in the base enamel would have to be altered instead of those in the thinner, or even in addition thereto. Several formulae have been tried experimentally and are considered practical, Fgure 6. As in the case of lacquer thinner, experienced enamel technologists will be able to vary these to achieve best results with their specific products. These formulae are intended for use with alkyd enamels.

1. This formula duplicates normal enamel film characteristics but offers better leveling.
2. This formula adds increased film build potential to better leveling.
3. This is similar to #2, but illustrates the use of alcohols to develop superior gloss.

These various applications of the High Film Build Theory have been production-tested and proven to be satisfactory when intelligently applied to reasonable plant operations. They make a more sensitive product which requires more attention in handling, yet have made possible much increased quality at tremendous savings in the cost of formerly wasted materials. The savings have been found to range from 10% to 20% of the cost of paint materials, in addition to labor saved in various ways.

References
(1) Announced by John Picknes, Flint Laboratory, E. I. DuPont DeNemours & Co. before the General Motors Paint Committee, 1953.

•

Glidden to Handle Own Foreign Business

The Glidden Company has announced that its subsidiary, Glidden International C. A., has completed arrangements to take over and handle the foreign business of Glidden's Southern Chemical Division from the Atlantic, White Sea & Baltic Company of Jacksonville, Fla.

The principal products involved are gum rosin, turpentine, pine tar and terpene chemicals.

Atlantic, White Sea & Baltic Co. will cease operations and be liquidated during the coming year, according to E. W. Colledge, Jr., president of the export firm.

•

Seven Paint Firms Cited

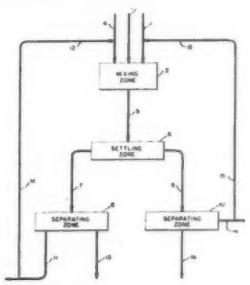
Awards for being "excellently managed" have gone to seven paint firms prominent in the paint industry. The awards were given by American Institute of Management, and marks the sixth consecutive year these firms have received the citation.

Those named are: E. I. Du Pont de Nemours & Co., Hibbard, Spencer, Bartlett & Co., Inter Chemical Corp., Pittsburgh Plate Glass Co., Pratt & Lambert Inc., The Ruberoid Co., and National Lead Co.

prising an azo dye in which the coupling component is chosen from the group consisting of naringenin, hesperetin and eriodictyol, and comprising a volatilizable organic solvent chosen from the group consisting of methyl alcohol and lower aliphatic alcohol esters and ethers.

Production of Drying Oils

U. S. Patent 2,726,272. Herman S. Bloch, Chicago, and Richard C. Wackher, La Grange, Ill., assignors to Universal Oil Products Company, Chicago, Ill., a corporation of Delaware.



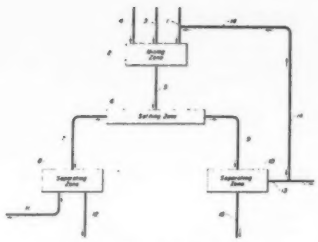
U. S. Patent 2, 726, 272

A process for producing a drying oil which comprises forming a reaction mixture consisting essentially of an olefinic hydrocarbon having at least three carbon atoms per molecule, an unsaturated organic compound selected from the members of the group consisting of a non-aromatic unsaturated organic acid, its anhydride, and amides, nitriles, alkyl esters, glycol esters, glyceryl esters and pentaerythritol esters of said acid, and a hydrogen fluoride catalyst, reacting said mixture until there is formed a reaction product comprising essentially saturated hydrocarbons and a used catalyst layer containing a complex of some of the hydrogen fluoride catalyst with poly-unsaturated liquid organic compounds, separating the reaction product into a hydrocarbon layer and a used hydrofluoric acid catalyst layer, separating a saturated hydrocarbon product from the hydrocarbon layer, and decomposing the complex in the used hydrofluoric acid catalyst layer to recover a drying oil having an average molecular weight greater than that of the olefinic hydrocarbon charge stock.

Production of Drying Oils

U. S. Patent 2,726,273. Herman S. Bloch, Chicago, and Richard C. Wackher, La Grange, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill., a corporation of Delaware.

A process for producing a drying oil which comprises mixing from about 0.1 to about 10 parts by weight of an acid-acting metal halide catalyst and 1 part by weight of a mixture of 1 molar proportion of a carbonylic compound



U. S. Patent 2, 726, 273

and 1-50 molar proportions of a monoolefinic hydrocarbon having at least 3 carbon atoms per molecule at a temperature of from about 0° to about 175° C., said carbonylic compound being a saturated compound containing a radical of the class consisting of aldehyde, ketone, carboxylic acid, ester and amide groups, agitating the reaction mixture for a time sufficient to form polymerization and condensation products and to effect hydrogen exchange to form a polyunsaturated drying oil, and a saturated hydrocarbon material, separating the reaction mixture into a hydrocarbon layer and an acid-acting metal halide catalyst layer, recovering a drying oil from the acid-acting metal halide catalyst layer and recovering a saturated hydrocarbon product from the hydrocarbon layer.

Production of Drying Oils

U. S. Patent 2,726,274. Herman S. Bloch, Chicago, and Richard C. Wackher, La Grange, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill., a corporation of Delaware.

A process for producing a drying oil which comprises mixing from about

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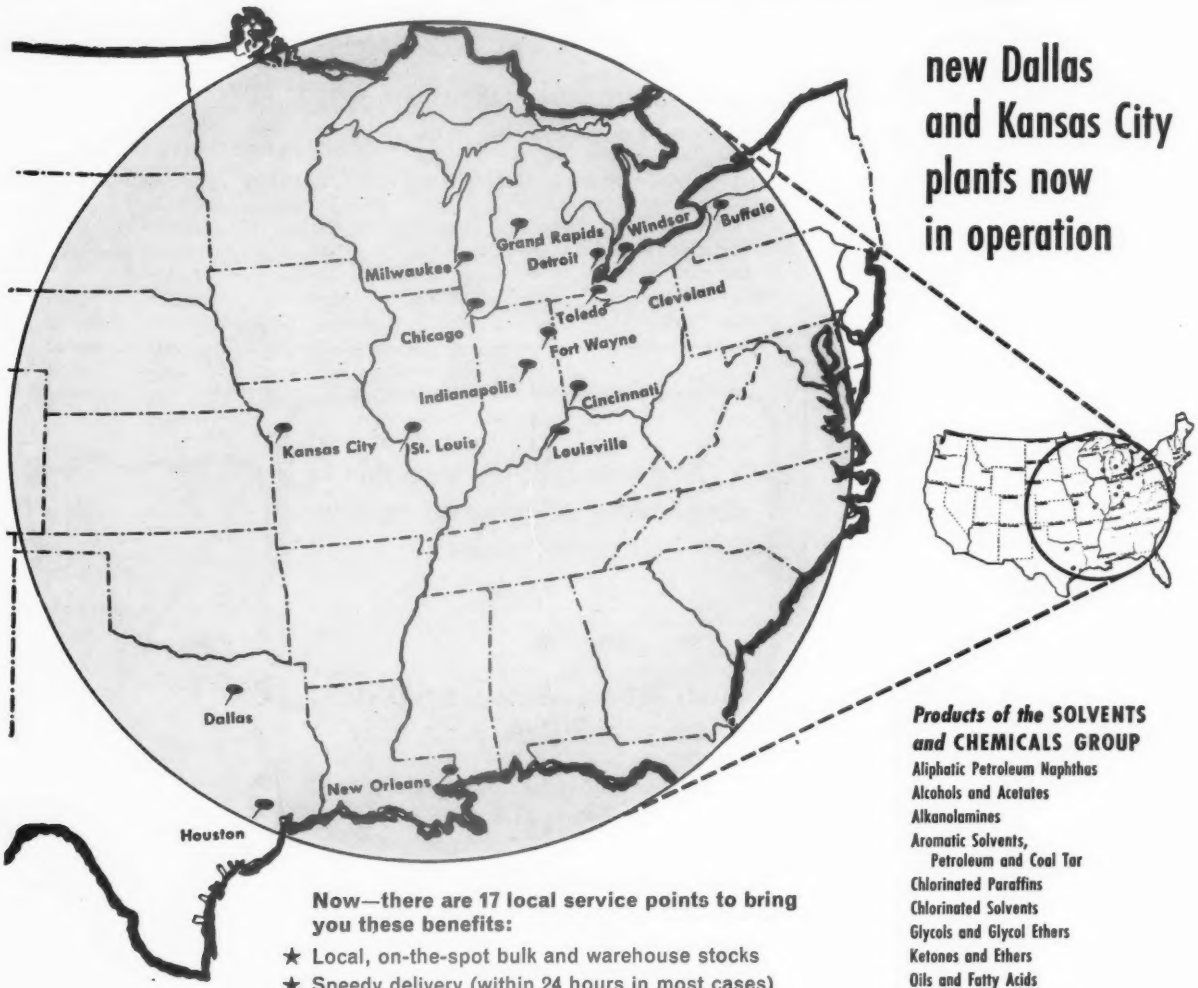

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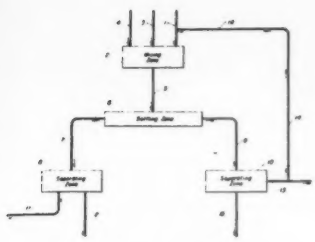
Grand Rapids 9, Michigan

THE SOLVENTS AND CHEMICALS GROUP

2540 West Flournoy Street • Chicago 12, Illinois



U. S. Patent 2, 726, 274

0.1 to about 10 parts per weight of a catalyst consisting essentially of an acid-acting metal halide and 1 part by weight of a mixture of from about 1 to about 50 molar proportions of a monoolefinic hydrocarbon having at least 3 carbon atoms per molecule and 1 molar proportion of an olefinic organic compound selected from the members of the group consisting of an olefinic alcohol, and olefinic thiol, an olefinic aldehyde, an olefinic ketone, an olefinic ester, and an olefinic ether at a temperature of from about 0 to about 175° C., and at a pressure of from about 1 to about 100 atmospheres, agitating the reaction mixture for a time sufficient to form polymerization and condensation products and to effect hydrogen exchange to form a reaction mixture containing a substantially saturated hydrocarbon product and an acid-acting metal halide catalyst layer containing a polyunsaturated drying oil, separating the reaction mixture into a hydrocarbon layer and an acid-acting metal halide catalyst layer, recovering a drying oil from the acid-acting metal halide catalyst layer, and recovering a substantially saturated hydrocarbon product from the hydrocarbon layer.

Storable Isocyanate-Modified Polyesters

U.S. Patent 2,725,366. Nelson V. Seeger, Cuyahoga Falls, and Thomas G. Mastin, Akron, Ohio, assignors by mesne assignments, to the Goodyear Tire & Rubber Company, a corporation of Ohio.

The process for making a cured elastomeric composition which comprises reacting (1) the elastomeric reaction product of (A) a material prepared from bifunctional ingredients including at least one dibasic carboxylic acid and at least one complementary bifunctional reactant selected from the group consisting of glycols, amino alcohols, and diamines, the hydrogen-bearing amino groups being present in an amount not to exceed 30% of the total number of hydrogen-bearing amino groups and hydroxyl groups present, said material having a hydroxyl number from 30 to 140 and an acid number from 0 to 12, and (B) at least one diisocyanate selected from the group consisting of hexamethylene diisocyanate and tetramethylene diisocyanate, the diisocy-

anate being used in an amount ranging from 1.00 to 1.20 mols per mol of said material, with (2) a sufficient amount of at least one polyisocyanate to bring the total of —NCO equivalents present in said cured composition to from 2.80 to 3.20 equivalents of —NCO per mol of said material.

Intumescent Coating Composition

U. S. Patent 2,722,523. Allan E. Gilchrist, Cleveland, Laurence D. Harrup, Lakewood, Robert C. Hendrickson, Cleveland, and Donald T. Rehor, Lynhurst, Ohio, assignors to The Glidden Company, Cleveland, Ohio, a corporation of Ohio.

The method of preparing a heat-curable, water-soluble, resinous binder, which comprises: providing a clear aqueous solution of polyhydric alcohol and aldehyde, said polyhydric alcohol being selected from the group consisting of sorbitol, mannitol, glycerine, pentaerythritol, sucrose, ethylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, propylene glycol, and butylene glycol, said aldehyde being selected from the group consisting of formaldehyde, acetaldehyde, paraformaldehyde and mixtures thereof, and said polyhydric alcohol and said aldehyde being proportioned therein to provide between ½ and 3 mols of alcohol per 3.5 moles to acidamide material as defined hereinbelow and to provide at least 1 mol of aldehyde per amide group mol of said acidamide material; adding base material to said solution in sufficient quantity to establish a pH of about 8 in the mass just after the acidamide material defined hereinbelow has been added; then adding acidamide material selected from the group consisting of urea, monoamides derived from monocarboxylic fatty acids having up to 18 carbons, monoamides derived from monocarboxylic hydroxy-fatty acids having up to 18 carbons, diamides derived from dicarboxylic fatty acids having from 2 to 36 carbons inclusive, diamides derived from dicarboxylic hydroxy-fatty acids having from 2 to 36 carbons inclusive, and mixtures of the foregoing materials; refluxing the resulting mass until condensation of said aldehyde with said acidamide material has been effected substantially completely; acidifying the refluxed mass to establish therein a pH between 4.5 and 5.0, then distilling water from the acidified mass until the distilland has a theoretical solids content of at least 60% and until a sample of the distilland, when tested at a theoretical solids content of 60% ,has a viscosity between about Z_2 and Z_4 (Gardner-Holdt), then discontinuing the distillation and promptly neutralizing the distilland with sufficient inorganic base selected from the group consisting of alkali metal base and alkali-earth metal base to establish a pH between 7 and 8 when the neutralized distilland has a theoretical solids content of 60%, and finally cooling the neutralized mass.

Stabilized Chlorinated Paraffin Wax

U.S. Patent 2,722,557 . . Robert C. Danison, Painesville, Ohio, assignor to Diamond Alkali Company, Cleveland, Ohio, a corporation of Delaware.

The method of stabilizing chlorinated paraffin wax having from 18 to 36 carbon atoms and from 50% to 80% of chemically combined chlorine, which includes the steps of contacting said chlorinated paraffin with a stabilizing amount of a substance chosen from the group of ethylene glycol, propylene glycol, glycerol, pentaerthritol, pentoses and hexoses.

A new composition of matter comprising a stabilized chlorinated paraffin wax having from 18 to 36 carbon atoms and from 69% to 71% of chemically combined chlorine and up to 5% of a substance chosen from the group of ethylene glycol, propylene glycol, glycerol, pentaerythritol, pentoses and hexoses.

Vinyl Resin

U.S. Patent 2,723,965. William E. Leistner, Brooklyn, Arthur C. Hecker; Richmond Hill, and Olga H. Knoepke, Brooklyn, N.Y.

A composition of matter comprising a vinyl chloride resin and a stabilizer therefor of the type formula

R—S—Y—COOMe

in which R is a monovalent hydrocarbon

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group containing 1-18 carbon atoms, Y is an alkylene group containing 1-5 carbon atoms, and Me is a metal selected from the group consisting of barium, strontium, calcium, magnesium, cadmium, lead, zinc and tin.

Polyvinyl Acetate Plasticized With a Polyester

U. S. Patent 2,726,225. Irving Pockel, Cambridge, Mass., assignor to Cambridge Industries Company, Cambridge, Mass., a corporation of Massachusetts.

A composition of matter comprising a polymer selected from the group consisting of polyvinyl acetate and polyvinyl acetate in which less than about 5% of the acetate groups have been hydrolyzed and, as a plasticizer therefor, a non-migrating, viscous liquid resinous polyester obtained by reacting diethylene glycol with an acid selected from the group consisting of terephthalic acid, isophthalic acid, and mixtures of terephthalic acid and isophthalic acid, and up to 35%, relative to the total amount of polyester, of a monobasic aromatic acid selected from the group consisting of benzoic acid and toluic acid.

Fluorescent Coating Method

U. S. Patent 2,726,966. James Thomson Anderson and Harold Francis Ward, Rugby, England, assignors to General Electric Company, a corporation of New York.

The process of coating a vitreous surface with powdered luminescent material which includes the steps of flowing over said surface a suspension of said luminescent material in a water solution of a water-soluble cellulose derivative capable of giving at least a moderately viscous solution and selected from the group consisting of methyl cellulose and glycol cellulose, draining the solution from said surface and drying the resultant coating, and thereafter heating the coating so formed to a temperature at which said water-soluble cellulose derivative is dispersed.

Flame Retardant, Water Repellent Compositions

U.S. Patent 2,723,212 . . Ralph Aarons, Wilmington, Del., and Douglas Wilson, Gary, Ind., assignors to E.I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware.

A composition consisting essentially of 100 parts by weight of ammonium sulfamate, from 5 to 20 parts by weight of dicyandiamide, from 5 to 30 parts by weight of boric acid, from 0.3 to 1.8 parts of a complex compound of the Werner type, in which a trivalent nuclear chromium atom is coordinated with an acyclic carboxylic acido group having at least 10 carbon atoms, by weight based on chromium content, and water.

Color Improvement of Drying Oils

U. S. Patent 2,727,051. Robert E. Blank, Mayfield Heights, and Albert A. Arters, Cleveland, Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio, a corporation of Ohio.

A process for producing a color stable, bleached vegetable oil which comprises heating under an inert atmosphere a vegetable oil selected from the group consisting of drying and semi-drying oils with an acylating agent selected from the group consisting of acid halides and acid anhydrides of aliphatic monocarboxylic acids containing from 2 to 18 carbon atoms in the acyl radicle at a temperature of from about 100° C. to about 325° C. for a period of from about 0.25 hour to about 20 hours.

Latex Coating Containing Zinc Phosphate-Modified Zinc Oxide

U. S. Patent 2,727,012. Lyle G. Treat and Laurence L. Ryden, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware.

A latex coating composition comprising an intimate mixture of a pigment, including a zinc oxide coated with zinc phosphate, and an alkaline aqueous film forming polymer dispersion, which polymer is selected from the group consisting of copolymers of an aliphatic conjugated diolefin and a monovinyl aromatic hydrocarbon and plasticized homopolymers of monovinyl aromatic hydrocarbons, and an oleic acid salt of a beta-oxyalkylamine selected from the class consisting of beta-hydroxyalkyl amines and morpholinyl compounds in an amount corresponding to at least two parts by weight per 100 parts of pigment.

Alcoholysis of Oils, Fats, and Waxes

U. S. Patent 2,727,049. Frédéric Fransois Albert Braconier, Plainevaux, and Joseph Marie Jean Hermesse, Embourg, Liege, Belgium, assignors to Societe Belge de l'Azote et des Produits Chimiques du Marly, Liege, Belgium, a company of Belgium.

A process for the alcoholysis of a substance selected from the group consisting of oils, fats and waxes, which comprises passing a mixture of said substance and an excess of an aliphatic monovalent alcohol over a fixed catalyst for heterogeneous catalysis consisting essentially of zinc silicate at a pressure approximating the critical pressure of said alcohol and separating the resulting products from each other.

Polystyrene, Butadiene-Styrene and a Phosphite Ester

U. S. Patent 2,726,226. Robert L. Werkheiser, Springfield, Mass., assignor to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.

A composition comprising 100 parts of polystyrene, from 1 to 20 parts of a copolymer of butadiene and styrene in which the combined butadiene constitutes at least 50% by weight and from 0.05 to 1 part of an organic monohydric alcohol ester of phosphorous acid, said composition having been prepared by dissolving the copolymer and the phosphorous acid ester in the styrene monomer followed by polymerization of the monomer to an average molecular weight of at least 30,000.

Polishing Wax Emulsion

U. S. Patent 2,726,961. Ralph K. Iler, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware.

A wax emulsion polishing composition containing from 10 to 50% of SiO_2, based upon the solid content of the wax emulsion, of an aqueous silica sol having a silica: alkali metal oxide mole ratio of from 130:1 to 500:1, a relative viscosity of from 1.15 to 1.55 as measured at 10% SiO_2 and pH 10, and a specific conductance, as measured at 10% SiO_2 and 28° C., of less than

$$\left(\frac{10{,}000}{R}+30\right)\times 10^{-5}\ \text{mho/cm.}$$

where R is the silica:alkali metal oxide mole ratio, and containing amorphous silica in the form of dense, non-agglomerated, spherical particles having an average particle diameter of 10 to 130 millimicrons.

Surfacer for Walls

U. S. Patent 2,728,681. Samuel Clipson, London, England

A composition for coating surfaces by spraying, comprising a mixture of from 5 to 8 volumes of dry exfoliated vermiculite; 2.5 volumes of a lime sludge containing 40% moisture; approximately 1.5 volumes of Portland cement, and 3 volumes of water.

Ethyl Cellulose Containing Benzene Hexachloride

U. S. Patent 2,727,824. William P. ter Horst, Lewiston, N. Y., assignor to Olin Mathieson Chemical Corporation, a corporation of Virginia.

A composition of matter which consists essentially of ethyl cellulose and from about 1% to the compatible limit of benzene hexachloride.

NEWS

Brighton Copper Works Announces New Name

Alvin Hock, Sr., president has announced that the Brighton Copper Works, Inc., Cincinnati, Ohio, has formally changed its name to the Brighton Corporation. This reflects no change whatever in company policy, personnel or ownership, he asserted.

Alvin Hock, Sr.

According to Mr. Hock, who founded the company in 1914, the former name, Brighton Copper Works, Inc. no longer accurately describes the full scope of service Brighton now offers, since copper fabrication represents only a small part of its business. In keeping with the needs of the chemical process industries, Brighton metalsmiths work more frequently with stainless steel, monel metal, nickel, aluminum, silver and various alloys.

The Brighton Corporation serves the chemical process industries by designing and fabricating tanks, kettles, fractionating towers, stills, evaporators, synthetic resin kettles, and paint and varnish kettles.

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J. C. Moore Opens Own Paint Consulting Service

John C. Moore, for the past eight years technical director of the National Paint, Varnish and Lacquer Association, recently resigned to open consulting offices for individual paint manufacturers, users and raw material suppliers, and for companies or organizations serving the paint and related industries. He will continue as a special consultant for the Association.

Mr. Moore's offices are located at 6306 Winston Dr., Bethesda, Md.

Before coming to the Association, Mr. Moore was superintendent of the Sinclair Refining Co. paint plant for 30 years. In 1947, he was president of the Federation of Paint and Varnish Production Clubs. He is now director of the American Society for Testing Materials, a member of the American Chemical Society, and an American Institute of Chemists Fellow.

The new consulting service will handle problems on paint production, technical matters and marketing; problems of the paint user; how best to produce and use raw materials available to the paint and related industries; and litigation and technical matters. A research laboratory will be available to supplement the consulting service.

Shell Builds New MEK Plant

Shell Chemical Corp. has started construction on a methyl ethyl ketone plant at Norco, Louisiana, that will have a capacity of 40,000,000 pounds a year.

The plant—Shell's fourth for the production of MEK—will begin producing in early 1957, according to R. C. McCurdy, president.

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Massaglia Joins Atlas

Edward J. Massaglia has joined Atlas Powder Co. as assistant general manager of the chemicals division, it was announced by Ralph K. Gottshall, president.

NEWS

Latex Spring Promotion Slated by Dow Chemical

Operation "Step Up," a big latex paint spring promotional program, has been announced by the Dow Chemical Co., Midland. Mich.

The promotion will be spearheaded by a strong advertising campaign in consumer publications. Its theme will be "Why Wash Those Walls. . .It's So Easy To Give Them Fresh, New Beauty With Latex Paints." Informative booklets will show the dealer how to tie in with newspaper ads, and also provide him with one-minute television and radio scripts, window and point-of-sale display ideas, window banners and selling phrases.

M.H.P. Morand, Dow's coatings sales manager, in commenting on the promotion, pointed out that "statistics show the average room is painted every three years. If we can make it every two years," he said, "we automatically increase sales 50 per cent—and this promotion should help to do it. We feel that the theme is provocative, lively, with lots of tie-in possibilities at the dealer level. And it reaches out and touches the housewife's desire to add new color to her home."

The program will reach the painter, architect, maintenance man and decorator through advertising, direct mail, Dow's membership in the National Producers' Council, trade shows and exhibits. The professional will also be reached through a new movie, "Miracle In Color," produced by the company. Finally, an advertising campaign will carry the details of the promotion to the trade.

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N.E. Paint Course Proves Popular With Students

"Paint Technology II," an evening course sponsored by the New England Paint and Varnish Production Club at Northeastern University, keeps its students coming back for more. Among the forty enrolled are technical personnel of the paint industry, raw material suppliers and career-minded university students.

The twelfth session was typical of those passed. The subject was "Corrosion—Theory and Practice." In the first hour, Instructor Gregor Berstein, covered such topics as "Mechanism of Corrosion," "Surface Preparation and Pretreatment" and "Formulation and Testing of Primers."

For the second hour, Howard Jerome, Vice President of the New England Club, spoke on "A study of Primer for Ferrous Metals in an Atmospheric Exposure." With the use of color slides and actual test-fence panels, he gave the exposure background and conclusions of a seven year study by the Club Committee which he heads.

The remaining sessions will consist of a talk on "Caulking and Glazing Compounds," followed by a laboratory period on test methods, a review of past lectures and an examination for those desiring a Course Certificate for college credit.

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Hercules Albany Office

The establishment of a new branch sales office in Albany, N.Y., was announced recently by the synthetics department of Hercules Powder Co.

The new office will be located in the Home Savings Bank Building,.

abstracts

Modern Refrigerator Finishes

By G. L. Vandone: Pitture e Vernici, vo. 10, No. 2, pp. 129-132

The pre-treatment and lacquering of refrigerator unit parts is conducted by the flow-production process and this finish treatment is in 6 stages: Treatment with warm alkaline emulsion; a dual rinsing with warm water; hot short-period phosphating; rinsing with warm water at 60° to 70° C.; subsequent treatment with hot chromic-phosphoric acid solution; rinsing with soft warm water.

After the cleaning stage, the parts are dried in a gas heated oven. Subsequently, the parts are rubbed down, pre-heated and are then automatically lacquer-coated in an electrostatic paint spraying installation at 40° to 50° C., being twice coated in an electrostatic field of 100,000 volts, and being processed with multiple spray guns on all sides. With each spray-finish stage, a coating of 0.025 mm. is achieved. Subsequently the finish coating is baked in infra-red ovens at 150° C.

The refrigerator enamel finishes which have been developed on the basis of vinyl, acryl, epichlorhydrine or aldehyde-amine resins must be corrosion resistant and resistant to impact and mechanical shock. Also, resistant to water, soaps, organic fruit-acids, etc., and the finish must show the maximum brilliancy and hardness with absolute color tone stability. The following operations are outlined for a practical testing of refrigerator enamel finishes: Resistance to organic acids; resistance to alcohol; resistance to grease; moisture resistance stability; color-tone stability; white tone measurement; finish film hardness determination; Erichsen deep-pressing test; adhesion strength.

Bituminous Paints for Concrete

By W. Gruen: Beton-Zement, vol. 4, No. 5/6, pp. 65-68.

Bituminous protective paint coatings on a concrete surface should serve to retain the water necessary for the hydration of the cement firmly in the concrete and also to protect the fresh concrete against the action of aggressive fluids. For the purpose of testing the suitability of various bituminous paints for this application, profiled concrete slabs were treated in the fresh condition with 1-3 bitumen coatings. No absolute dense film could be achieved with a one coat finish. With a two-coat finish the film was dense as with this the pores of the first finish coating had been closed up. With a three coat finish an absolutely dense protective film on the concrete mortar was obtained.

After coating, the protected mortar slabs were exposed to a 2 years test period action of tapwater (Hardness 9.6° DH), distilled water, 2% sulfuric acid, 10% magnesium sulfate solution, 5 times concentrated sea water, 10% ammonium nitrate, 10% calcium chloride, and mine water containing magnesium chloride. The coated and non-coated concrete slabs were not damaged by exposure to tap water, but the impermeability of the concrete to the water was considerably increased by a 2-3 coat bitumen finish.

In the latter case, the under-side of the slabs remained perfectly dry, water seeping-through had not occurred. With the action of distilled water, with the

non-coated test bodies, lime-leaching from the concrete was found; the underside of the slabs showed calcium carbonate growth. With the concrete test bodies with a 1 coat finish in places there was a weak penetration through of the water and commencement of lime leaching could be seen. With a 2 and 3 coat finish the underside of the slabs remained perfectly dry; a complete sealing of the surface was obtained with the protective coating. A 2% sulfuric acid solution causes a strong destruction of the unprotected concrete. A 1 coat finish gave insufficient protection here and similarly a 2 coat finish. Only the 3 coat protective finish withstood for a prolonged time the aggressive action of the 2% sulfuric acid. The action of the 10% magnesium sulfate caused swell cracks on the unprotected concrete. The 1 coat finish gave insufficient protection while the 3 coat protective finish provided a complete protection to the concrete.

The 5 times concentrated sea water likewise caused a definite damaging of the unprotected concrete; a 3 coat bitumen finish also gave complete protection in this case. The unprotected concrete was destroyed within a short time by the 10% calcium chloride solution, while a 2 and 3 coat bitumen finish again served to provide adequate protection. A similar result was given with the action of mine water containing magnesium chloride. The protective action of the bitumen finish coatings was also confirmed by strength tests, shrinkage measurements and frost-resistance tests on the concrete test bodies investigated. The concrete mortar treated with the bitumen coatings attained only about 50% of the shrinkage of the normal mortar.

The Desmophene-Desmodur Finishes

By R. Hebermehl: Deutsche Farben Zeitschrift, vol. 8, No. 12, p. 485.

The author surveyed the structure of the Desmophene and Desmodur paints (Isocyanates) and the reaction mechanism and then considered the application characteristics of these paints. It was pointed out that it is necessary to balance the formulation of these finishes with the application objective.

These finishes can be used for brickwork and concrete. For this purpose it is desirable to give a primer coating in which alkali-resistant agents such as Clophene are present.

The iso-cyanate groups which under some circumstances can be still present in the free form in the lacquer film are not toxic. The toxic characteristics of the isocyanates are associated with their volatility. These finishes can be used with advantage on wood. The influence the moisture content of the wood has, has not been definitely clarified. There exists the possibility that a certain part of the iso-cyanate groups reacts with the wood moisture. The isocyanate finishes have also been applied with good results as a sealing finish to wood. The application of the hard Desmophene tyes is of advantage for po re-filling applications.

The air moisture during the drying period of the film can be of influence on the final film characteristics. One day should elapse between coat applications. The normal stability of the prepared finish is one day. Many of these lacquers dry slower with relation to the moisture content which exerts a catalytic influence. By catalysts, for example tertiary bases, the film formation can be accelerated. Under normal conditions, the films are heat-stable. Decomposition of the urethane compounds sets in to any considerable extent only at temperatures above 200° C.

To ensure good adhesion of a second coating on a DD lacquer, it is necessary to apply the second coating after a certain hardening-out time of the first coating. The first coating should be hard, but not too hard, in order to achieve maximum adhesion strength. The most favorably conditions should be tested practically. With the use of pigments, care has to be taken that these pigments contain no moisture. The moisture content of pigments can fluctuate widely in accordance with the air humidity.

Reaction Primers With Polyvinylbutyral

By G. Mueller: Fette und Seifen, vol. 55, No. 12, pp. 840-844.

The polyvinyl butyral (Mowital B) which is prepared in various degrees of polymerization and acetalization, apart from being used in sheet form, packaging and lacquers, find a particular use in reaction primers in combination with basic zinc chromate and phosphoric acid. Polyvinyl butyral possesses an outstanding adhesion on steel and light metals. Various investigations were conducted to clarify the mode of action and the course of the reaction of wash primers.

Specimens examined with the electron microscope showed that iron and aluminum were only etched in the upper molecular coatings by the reaction primer. The normal primer is too reactive for magnesium. The phosphoric acid reacts with magnesium with the generation of hydrogen, by which the adhesion film becomes blistered and pinholed. A wash primer which is formulated with ¼ of the normal amount of acid should be suitable as an adhesion primer for magnesium. In order to be able to ascertain and evaluate the strength of the anchoring of the reaction primer coating on metal, the adhesion strength of polyvinylbutyral on metallic surfaces was measured and the influence of zinc chromate and phosphoric acid admixtures on this was studied. The measurement of the tearing-off force in kg. on metal strips of 2 cm. width, gave the following values:

(*See table top of page.*)

Metal Strip	Alone	Mowital B 30H With Zinc Chromate	With Zinc Chromate plus phosphoric acid
Steel	0.5 - 0.6	1.0 - 1.1	1.2 - 1.5
Aluminium	0.3	0.5 - 0.6	0.6 - 0.8
Copper	9.3	0.6 - 0.8	0.5 - 0.6

According to this, the adhesion is greatest on steel surfaces. By pigmentation with basic zinc chromate and the addition of phosphoric acid, the adhesion can be increased over the value for the pure film-forming vehicle. Under-water finish coatings should show a high adhesion, high water-resistant strength, and a high electrical-rupturing resistance.

Through-dried adhesion coatings give practically the same favorable values as the pure Mowital film. The through-dried reaction primer film possesses greater hardness than a film which is only pigmented with zinc chromate. The adhesion reaction-primer process is particularly suitable for protective lacquer coatings exposed to severe conditions. For the production of an effective adhesion coating, a series of complicated chemical reactions is necessary, by which basic zinc chromate and phosphoric acid are reaction participants of the first order, polyvinyl butyral, alcohol and water as well as the metal base are of the second order.

Resistant Paint Finishes From Fluorine-Containing Polymerizates

By G. Bier, A. Schaeff and K. H. Kahrs: Angew. Chemie, vol. 66, No. II, pp. 285-292.

Fluorine-containing polymerizates, contain in a similar manner to the silicones, an inorganic element—fluorine instead of silicon. The fluorine-containing polymerizates which are produced by various methods and in varying molecular sizes, such as polytetrafluorethylene and polytrifluorchlorethylene possess an outstanding chemical and thermal stability, particularly against concentrated acids and alkaline lyes, as the imposition of the F-substitutions causes a strengthening of the normal linkages.

As these polymerizates are insoluble in most of the normal solvent mediums, they are employed in surface protection in the form of dispersions. The dispersion is applied as a thin coating i.e. by spraying; the dispersing medium is

evaporated and the polymerizate coating stoved-in. This process is repeated several times by which the coated metal then attains the corrosion resistance of the polytrifluor-chlorethylene or of the polytetrafluorethylene respectively. The technique of surface protection by means of polytrifluor-chlorethylene is still in the development stage.

Electrical Insulation Lacquers With Hardenable Silicones

By P. Nowak and E. Rickling: Kunstoffe, vol. 44, No. 5, pp. 191-197.

Among the methyl and methylphenyl-polysiloxananes used technically as heat resistant insulating materials, the thermal hardening silicone resins play a special role. Where questions of strength and touchness are concerned, use is predominantly made of mixed silicone resins with a ratio of methyl to phenyl groups as 1.0 :0.65. This silicone resin possesses high heat resistance, as the oxidative more stable phenyl groups stabilize the methyl end chains. A methyl-phenyl silicone resin of this type showed a satisfactory thermal stability even with a one year's heat aging at 200° C.

The polysiloxanes do actually polymerize at elevated temperature even without accelerator, but with the co-use of hardening accelerators the hardening time and the hardening temperature are reduced; the hardness should not adversely affect the thermal stability and should not too strongly reduce the stability of the resin solution. With hardening tests there was used 0.05—0.11% Co as naphthenate; 0.02—0.06% Pb as naphthenate and 0.13% Fe as an organic complex compound. The most effective agent was shown to be Pb followed by iron and cobalt with decreasing effectiveness. As lead causes a stronger polymerization of the resins, the films show a lower thermal stability; the Erichsen test values fall away stronger and the films tend toward hairline crack formation. This disadvantage is not present with the addition of cobalt.

With the addition of cobalt it is true that the hardening is considerably prolonged as compared with lead but nevertheless so shortened as compared with the resins without accelerator that it becomes a commercial possibility. The addition of cobalt naphthenate has been found satisfactory with electrical impregnation lacquers for fibreglass insulated electrical wire and with electro pastes. The resins hardened with the iron complex compounds behave in a similar manner as with those accelerated with cobalt. As for the stability of the resin solutions modified with the accelerators and with 75% solid body content, it was found that cobalt naphthenate changes the viscosity of the resin solutions in the temperature range of 20 to 50 C. only very little while lead naphthenate already causes a gelification at 20° C. after a short time. The iron accelerator can be added with a short-period storage time.

Coating Lacquers: As methyl and methylphenyl silicone resins do not adhere sufficiently well on copper, for the elevated temperature grades F (continuous thermal stability at 155° C.) and H (continuous thermal stability at 180° C.), copper wires wound with fibreglass insulation were used with silicone impregnation. According to the lacquering speed and stoving oven length, the silicone lacquers were stoved at 300° to 400° C.

Impregnating Lacquers and Pastes: For the vacuum impregnation of coils and windings of silicone-glass fibre wires, use was made of methylphenyl silicones. Before the impregnation the coils were preheated for some hours at 150° C. to drive out the moisture. After the impregnation the first heat treatment followed at temperatures up to 150° C. After the second impregnation process there followed, to prevent the formation of voids, a stagewise hardening up to at least 200° C. The hardening temperature should exceed as far as possible the subsequent operational temperature, in order to avoid a later softening of the silicone lacquer. The silicone impregnation lacquers can be so strongly modified with filling agents that they assume a paste-like consistency.

By this means there is achieved more favorable moisture and water-resistance characteristics, better thermal conductivity and mechanical strength.

GAMMA RADIATION

(*From page 33*)

4, and the per cent elongation data, Table I, reveal an interesting fact, namely the maximum loads occur at almost the same percentage of elongation. The breaking load for irradiated film is more variable but the variations are well within experimental error of cast films.

The breaking load elongations, Figure 3, for air dried films cluster around the same elongation for a two inch specimen as the elongation of the irradiated film, Figure 4.

Conclusions

The indications are that gamma irradiation in the tested dosage has little effect on the physical properties of soya-bean oil alkyd resin films submitted to gamma irradiation in the wet state.

The gamma radiation moderately reduces the induction drying period of wet films.

The maximum loads and the breaking loads for irradiated wet films of the soya-bean oil alkyd investigated occur at nearly the same elongation value.

Acknowledgement

This investigation was made possible by a grant from the Nash-Kelvinator Corporation to the Michigan Memorial Phoenix Project at the University of Michigan.

The authors desire to thank the Fission Products Laboratory at the University of Michigan for their cooperation and the use of their gamma irradiation facilities.

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New Warehouse, Sales

Pennsylvania Industrial Chemical Corp. has announced the opening of a new warehouse at Jefferson Terminal, 1900 E. Jefferson Detroit 7, Mich.

The company has also established a sales residency in the Cincinnati area, working out of its Detroit office. Robert D. Kinny will represent the company exclusively on all products available for sales and distribution in the Cincinnati area.

Canadian Coatings Div. To Hold Two Meetings

The Protective Coatings Division of The Chemical Institute of Canada will hold its 10th Divisional Conference Feb. 23 at the Royal York Hotel, Toronto, and Feb. 24 at the Ritz Carlton Hotel, Montreal.

The same program is scheduled for both cities.

Speakers will include: F. K. Daniel, Daniel Products Co., New York, "The Influence of Solvents on Pigment Dispersion and Seeding"; B. M. Baker, Canadian Industries Ltd., "Some Applications of Colorimetry"; R. P. A. Sims, Department of Agriculture, Ottawa, "Polymerization of Vegetable Oils"; W. D. McMaster, Research Laboratories, General Motors, Detroit, "Durability of Films"; and J. V. Lang, The Hardesty Co., "Fatty Acids."

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Correction

It was inadvertently stated last month that the newly formed M-Co Paint Processing Machine Co. was formerly the Epworth Manufacturing Co. Epworth continues as a Sales and Engineering organization, stopping only its manufacturing operations. M-Co was formed to manufacture the products previously manufactured by Epworth.

Plan New Tall Oil Unit

Engineering studies for a new tall oil fractionating unit at Springhill, La., have been authorized by the Arizona Chemical Co., it was announced by Richard E. Sumner, president.

The purpose of the proposed Springhill plant will be to provide for growing customer demands and to assure for them a continuing supply of tall oil fatty acids and rosins, Mr. Sumner said.

Columbia-Southern

Columbia-Southern Chemical Corp., has announced plans for an extensive expansion of research and development work at its Barberton, Ohio, plant.

According to Joseph A. Neubauer, vice president and technical director, the program will cost in excess of a million dollars and will include the construction of an ultra-modern research building.

CALENDAR OF EVENTS

Feb. 21-24. Painting and Decorating Contractors of America Convention Sheraton-Park Hotel, Washington, D. C.

Feb. 23-24. 10th Divisional Protective Coating Conference, Chemical Institute of Canada. Feb. 23—Royal York Hotel, Toronto; Feb. 24—Sheraton-Mount Royal Hotel, Montreal.

Feb. 27-Mar. 2. ASTM Committee Week, Statler Hotel, Buffalo, N. Y.

Feb. 29-Mar. 2. 20th Annual Convention Southern Paint and Varnish Production Club, Atlanta Biltmore Hotel, Atlanta, Ga.

Mar. 22-24. Spring Symposium and Raw Material Exhibit of the West Coast Paint and Varnish Production Clubs, Statler Hotel, Los Angeles, Calif.

Production Club Meetings

Baltimore, 2nd Friday, Park Plaza Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April, Suttmilers.
Indianapolis — Sept., Claypoll Hotel.
Columbus — Jan., June, Fort Hayes Hotel.

Cleveland, 3rd Friday, Harvey Restaurant.

Dallas, 2nd Thursday, No Fixed Place.

Detroit, 4th Tuesday, Rackham Building.

Golden Gate, 3rd Monday, El Jardin Restaurant, San Francisco.

Houston, 2nd Tuesday, College Inn.

Kansas City, 2nd Thursday, Pickwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville, 3rd Wednesday, Seelbach Hotel.

New England, 3rd Thursday, University Club, Boston.

New York, 1st Thursday, Brass Rail, 100 Park Ave.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, Annual Meetings Only.

Philadelphia, 3rd Wednesday, Engineer's Club.

Pittsburgh, 1st Monday, Fort Pitt Hotel.

Rocky Mountain, 2nd Wednesday.

St. Louis, 3rd Tuesday, Forest Park Hotel.

Southern, Annual Meetings Only.

Toronto, 3rd Monday, Diana Sweets, Ltd.

Western New York, 1st Monday 40-8 Club Buffalo.

TECHNICAL Bulletins

CONTROLLED VOLUME PUMPS

Bulletin No. 855, describing the company's new line of controlled volume pumps for "downhill" metering of liquids and gases, is available from Milton Roy Co., Station M, 1300 E. Mermaid Lane, Philadelphia 18, Pa.

Bulletin details the operation and application of the new $-\triangle$ **P** (Minus Delta P) line of controlled volume pumps. Also given are specifications, capacities and features of the new unit for "downhill" pumping (from high suction pressures to lower discharge pressures).

Clear illustrations and descriptive copy show the application of this new unit in additive injection bottle filling, proportional feed and fluid sampling systems.

VISCOSITY CONTROLLER

Bulletin No. V-1211 describing and illustrating the company's Model M8C automatic viscosity controller for industrial processes, such as paint finishing, sizing and various coating processes has been issued by Norcross Corp., 247 Newtonville Ave., Newton 58, Mass.

ENGINEERING DIRECTORY

The Engineering Societies Directory, a complete list of all engineering societies in the United States, together with pertinent information about them has been scheduled for tentative publication in June. It will be published by Engineers Joint Council.

The Directory will be a new publication, not a revision of the Engineering Societies Yearbook, which was published in 1948, and which has been discontinued.

Questionnaires will be mailed to all known societies this month and should be returned by March. If a society has not received such a questionnaire by that time, it should contact Engineers Joint Council, 29 W. 39 St., New York City. The Directory will be available at $3.50 per copy.

GOODYEAR CHEMICAL DIV.

The Goodyear Tire & Rubber Co., Akron, Ohio has issued "Harvest Research: The Story of the Goodyear Chemical Division" by David Dietz. Mr. Dietz is Science Editor of the Scripps-Howard Newspapers and Lecturer in General Science, Western Reserve University.

The 54-page, illustrated book has the following chapter headings: Goodyear and Chemistry; Wider Chemical Horizons; The Rubber Industry; The Paint Industry; The Plastics Industry; The Textile Industry; and The Paper Industry.

FRACTIONAL HP MOTORS

A 12-page publication on fractional horsepower direct-current motors and equipment is available from the General Electric Co., Schenectady 5, N. Y.

Designated GEA-6068, the illustrated bulletin covers the complete line of fhp direct-current motors and equipment for direct application and built-in use. Included are typical applications, product features, ratings and specifications for standard models. Also described are the facilities, engineering, and application assistance available for the design and production of special models.

CHEMICALS FOR LATEX

Booklet F-8869A, which discusses the uses, advantages, and suggested proportions of chemicals for latex resin emulsions, has been released by Carbide and Carbon Chemicals Co., 30 E. 42 St., New York 17, N.Y.

Among the products discussed are an extensive group of monomers valuable in "tailor-making" resins, either as homopolymers or as copolymers. Emulsifiers and protective colloids are reviewed in relationship to emulsion polymerization. Physical modifiers discussed include plasticizers, solvents, thickeners, dispersants, and stabilizers.

TEMPERATURE CONTROL

A condensed catalog, G-20, covering its complete line of differential expansion temperature controls has been issued by The Burling Instrument Co., 16 River Rd., Chatham, N. J.

Included are pictures of all the current types, a description of their operation, general specifications of the entire line, and an Instrument Selection Chart.

The instruments shown are suitable either for controlling temperatures or for high temperature safety alarms and cut-outs. Both electric and pneumatic types are included, as are ranges from subzero to 1800° F.

TESTING INSTRUMENTS

The 92-page 1956 catalog of "Testing Instruments for the Paint and Other Industries" has been issued by Gardner Laboratory, Inc., Bethesda 14, Md.

Listed and illustrated are instruments for testing reflectance, color, gloss, haze, viscosity. Among the other instruments dealt with are constant temperature baths, regulators, cooling, humidity, salt spray, blush, film applicators, thickness gages, hiding, dipping, permeability, drying time, abrasion, adhesion, hardness, washability, mills, mixers, grind gages, aeration, ovens, muffle furnaces, pyrometers, weight cups, moisture meters, hot plates, magnifiers, press, timers, thermometers, steelware, balances, safety cans, spatulas. A price list is included.

COLLAPSIBLE TUBES

"Tube Talk," a 12-page booklet is available from the National Collapsible Tube Co., Dept. PV, 362 Carpenter St., Providence 9, R.I.

The main feature of the booklet is a copyrighted page of helpful conversions. Other features include "how to" pages for determining the right type of tube, and the metal for the tubes. Facts on the company's tube design service are also highlighted.

EPICHLORHYDRIN

An 8-page technical information bulletin, F-8862, on epichlorhydrin, a raw material for epoxy resins, ion-exchange resins, surface active agents, pharmaceuticals and dyestuffs, is available from Carbide and Carbon Chemicals Co., 30 E. 42 St., New York 17, N. Y.

Physical properties, applications, typical reactions, physiological properties, and references are presented in convenient and concise form.

TREATED OILS

A Technical Service Department Bulletin, entitled "Cykelin" describes oils treated with dicyclopentadiene, their properties and their applications to protective coating products and the results of tests of such products. A formulation for blister resistant house paint is included. Write Technical Service Department, Spencer Kellogg and Sons, Inc., Buffalo 5, N. Y.

PLANTS & EQUIPMENT

Equipment and complete plants for the chemical industry are listed and pictured in a catalog issued by the Export Dept. of the Blaw-Knox Co., 408 Lexington Ave., New York 17, N.Y. The catalog is available in English, French, Portugese and Spanish editions.

INDUSTRIAL FILTRATION

A 4-page brochure lists industrial filtration products together with the specific grades of filter paper most commonly used. It also includes specifications of E & D industrial and scientific papers. For copy write to Mr. Thomas H. Logan, Jr., The Eaton-Dikeman Co., Filtertown, Mt. Holly Springs, Pa.

INDEPENDENT LABORATORIES

The 1956 edition of the "Directory of the American Council of Independent Laboratories, Inc. contains scope sheets for 67 member laboratories which provide details of facilities and services, plus an extensive "Index of Services and Facilities."

The Index of Services, appearing for the first time in this new addition, lists over four hundred categories of services from abrasion testing to wool testing, from adhesives to waxes, from air pollution to vitamin research. Each category lists through code numbers the member laboratories specializing in each field as well as those qualified but not specializing.

Copies of the Directory may be obtained, free of charge, by writing on company letter-head to H. M. Dudley, Executive Secretary, American Council of Independent Laboratories, Inc., 4302 East-West Highway, Washington 14, D. C.

FILTRATION MANUAL

A "Filtration Manual for Product Designers" has been published by PurOlator Products, Inc., Rahway, N.J.

The 32-page, color-illustrated manual deals with why and where filters are used, planning filtration in advance, filtration engineering, where the designer can select a filter, applications that call for specialized study, and how filtration engineers can help the designer. Price $1 per copy.

RESIN RESEARCH

Two comprehensive studies, bulletins 219 and 203, on the use of hydrocarbon resins in paints and coating vehicles have been published by the Industrial Division of the Velsicol Chemical Corp., 330 E. Grand Ave., Chicago 11, Ill.

Both bulletins are based on experimental work conducted by Velsicol's Resin Development Laboratory and contain important new information now available for the first time, according to the company.

They cover not only the properties and specifications of resins and resin solutions, but also give numerous specific formulations and cooking procedures for aluminum vehicles, varnishes and enamels, bronzing liquids, membrane curing compounds, waterproofing and wood preservative compounds, and electrical insulation compounds, as well as many other special products.

SOLVENTS, SOLVENT OILS

Technical data on Picco "Solvents and Solvent Oils" are included in a new 6-page bulletin published by Pennsylvania Industrial Chemical Corp., Clairton, Pa. These products cover a complete range from low to high boiling solvents and a series of non-drying solvent oils. Charts showing typical analysis and distillation range for various grades are included, for Hi-Solv Aromatic Petroleum Naphthas, Picco Coal Tar Aromatic Solvents and Picco Solvent Oils.

BORON FLUORIDE

(*From page 42*)

2. In the case of a monomer comprising several isolated double bonds there will be a strong evolution tendency towards conjugated systems, a form which is electronically more stable, but which in turn is much more sensitive to polymerization of the Diels-Alder type.

The facts reported above are in good agreement with this theory. One observes that the distillable acids of standoils catalyzed by boron tri-fluoride have a melting point higher than those obtained from normal standoils. This proves an isomerization which can be of the type *cis-trans* (elaidization) or of position (conjugation).

Examination with the ultra-violet spectro-photometer shows a proportion of about 4 percent conjugated dienic acids in these distillable acids.

The action of the boron tri-fluoride on the linseed oil accelerates considerably the speed of polymerization in very precise conditions. In addition, it manifests its other properties by contributing to give to the phenomenon an aspect which is somewhat more complex than that of the simple thermal polymerization.

References

1. Eichwald; U. S. Patent 2,318,765; 2,127,811; 2.152,683; 2,160,572; 2.196,-670.
2. U. S. Patent 2,365,919—Uloth and Muller.
3. Topchiev and Wishnyakova; Zh. Obschei Khim., vol. 21, pp. 1618-25.
4. Croston, Tubb, Cowan and Teeter; Journ. Amer. Oil Chem. Soc. vol. 29, pp. 331-333.
5. Petit; Bull. Soc. Chim. France (1954) (to appear).

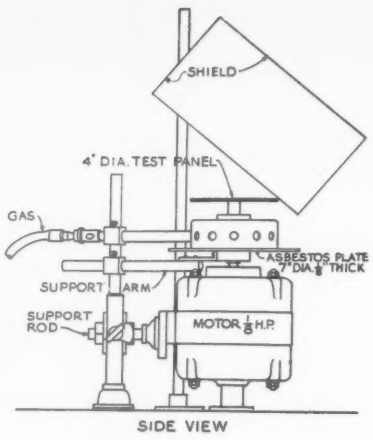
ASPHALT FILMS

(From page 43)

process was adapted to the Bureau's needs by providing a means for preheating the aluminum test panel to insure good bonding, and by heating the asphalt to an appropriate pouring consistency. The spinning-disk method is also applicable to other materials that have narrow softening-point ranges, rather than definite melting points, such as paraffin or stearic acid rosin.

The equipment consists simply of a 1/8-hp shunt-wound d-c motor, mounted on end, with a shaft extension at the upper end to which the test panel is fastened. The speed of the motor is regulated by two slide-wire resistors, one connected in series with the armature and the other in series with the field. Under the panel is a ring gas burner to heat the panel to its working temperature; the heat insures good bonding between the panel and the asphalt. An asbestos shield under the burner prevents asphalt from dripping onto the motor. A shield around the equipment retains material thrown from the disk during the coating operation.

The 4-in. aluminum disk test panel is prepared for coating by rubbing with fine steel wool saturated with water to provide a mat surface. It is then washed with mineral spirits, dried, and weighed.



Side plan of equipment for preparing thin asphalt films. A 1/8-hp variable-speed electric motor, mounted on end, has a shaft extension at the upper end to which a test panel is fastened. Under the panel is a ring burner to preheat the panel to its working temperature; the heat insures good bonding between the panel and the asphalt. An asbestos shield under the burner prevents asphalt from dripping on the motor. A shield (shown raised here) retains material thrown from the disk during the coating operation.

A screw through a hole in the center of the disk holds it firmly to the motor shaft.

For uniform films, occluded air is removed from the asphalt by heating until fluid and placing under a vacuum for several minutes. This cycle is repeated until there is no evidence of foaming immediately after the material is placed in the vacuum.

To prepare an asphalt film, the aluminum disk is first fastened to the motor shaft and centered to be free of vibration. The disk is then heated, while rotating, by the ring burner to about 200 to 220° F. The flame is extinguished, and molten asphalt is poured onto the rapidly spinning disk, starting near the center and working toward the edge. As soon as the spinning disk is completely covered, it is stopped and removed from the motor shaft.

Coating thickness is determined indirectly from the weight, density, and area of the asphalt coating. The thickness of the coating depends mainly on the speed of the disk and the consistency of the molten asphalt. Usually only a few trial panels are sufficient to determine the working tolerances of speed and temperature. Once these are determined, the process is easily repeated to produce many panels with coatings varying in thickness by small increments. Results of accelerated weathering tests on panels prepared by the spinning method reveal that the coating is significantly uniform over the entire area to exhibit a uniform pattern of deterioration.

References

1. Preparation of thin bituminous films by spinning, L. R. Kleinschmidt, ASTM Bulletin No. 193, 53 (October 1953).
2. Some physical properties of paints, P. H. Walker and J. G. Thompson. Proc. Am. Soc. Testing Materials **22**, Part II, 464 (1922).

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New Dow Latex Plant

A plant for the production of synthetic latex will be built at Pittsburg, California, by The Dow Chemical Co., it was announced by R. L. Curtis, vice president and general manager of Dow's western division.

Construction will start at once and it is expected the million dollar facility will be in production this fall, he said.

•

Continental Can to Build

Continental Can Co. will build a new, completely modern plant in Cincinnati that will double its present can manufacturing facilities and its employment rolls in that city, it was announced by William M. Cameron, vice president in charge of the central metal division. The new plant is expected to be in operation by July, 1957.

CLASSIFIED ADVERTISEMENTS

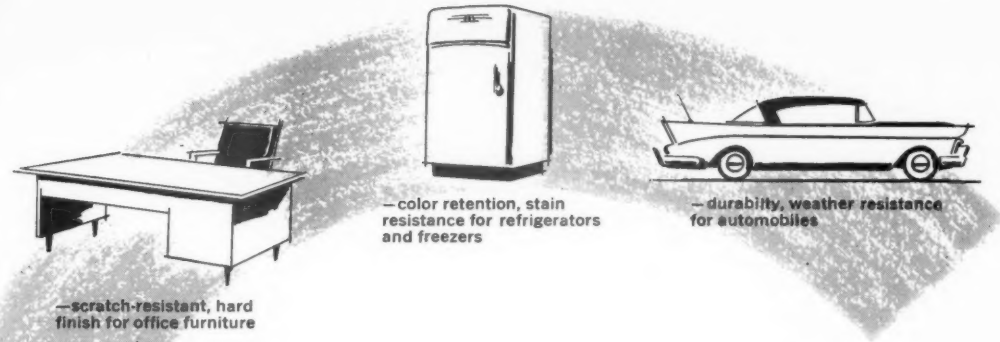
Rates: $.20 per word, except those seeking employment, for which rate is $.10 per word. Minimum: ten words. Address all replies to Box Number, c/o Paint and Varnish Production, 855 Avenue of the Americas, New York 1, New York.

FOR SALE—Lehmann 13"x32"—5 Roll mill. 20 HP explosion proof Allis-Chalmers motor. Completely rebuilt and guaranteed like new. Price $3750. Sullivan Varnish Co., 410 N. Hart St., Chicago 22, Ill.

Position Wanted—German paint technologist, 6 years practical experience, 6 terms Chemistry. Complete knowledge of formulations for industrial finishes, marine paints, synthetic enamels and latices. Experience in organizing production. Box 211.

Position Wanted—with industrial finishes mfr. in Calif. only. Chem. degree 8 yrs. exp. with air, airless, electrostitic, steam spray. Box 210.

ADVERTISERS' INDEX



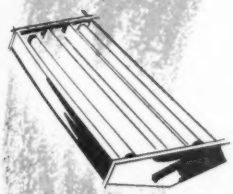
—color retention, stain resistance for refrigerators and freezers

—durability, weather resistance for automobiles

—scratch-resistant, hard finish for office furniture

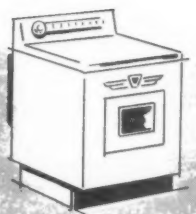
Versatile? and how!

melamine resin 248-8

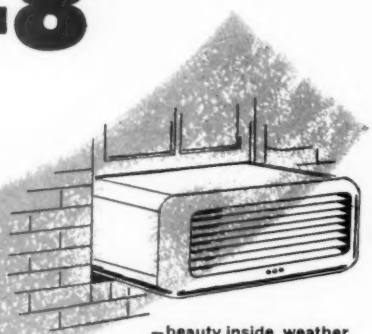


—color retention, heat resistance for fluorescent light fixtures

—toughness, low cost for hot-water boilers



—gloss and chemical resistance for washing machines



—beauty inside, weather resistance outside for air conditioners

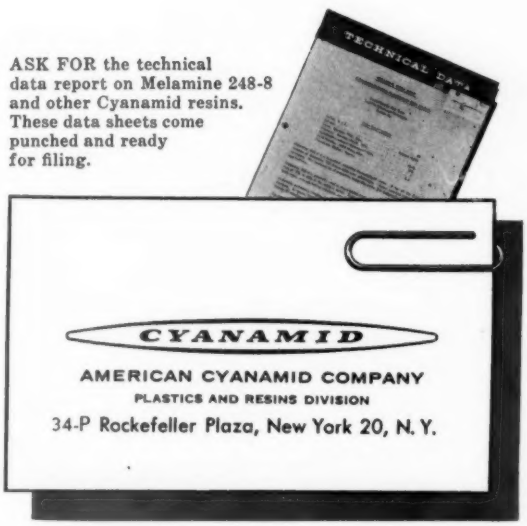
Comes pretty close to being *the universal melamine resin!* And it's easy to see why. Improved MELAMINE Resin 248-8 combines:

Lightning-fast curing speed
Maximum chemical resistance
Superior color retention
Excellent hardness and gloss
Economy

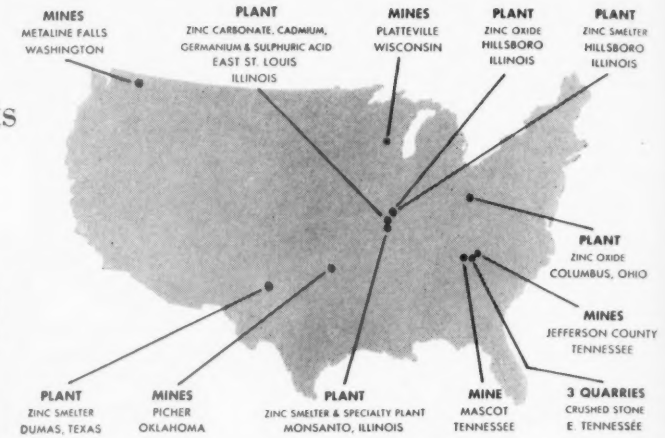
We'll be glad to help you realize all these advantages from this butylated melamine resin.

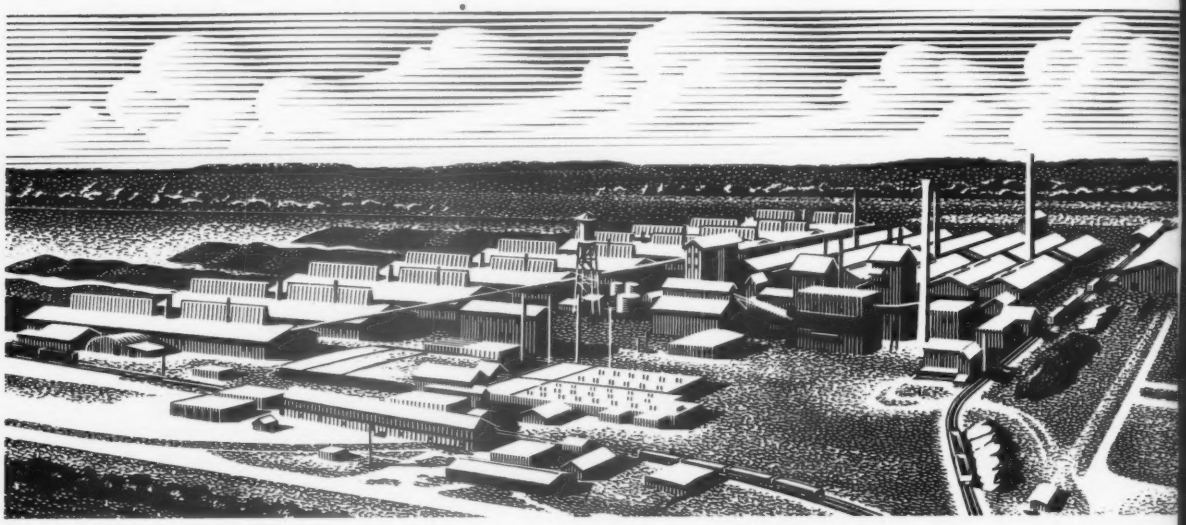
In Canada: North American Cyanamid Limited, Toronto and Montreal

ASK FOR the technical data report on Melamine 248-8 and other Cyanamid resins. These data sheets come punched and ready for filing.



American Zinc and its products *from* A to Z





SMELTER AT
DUMAS, TEXAS

Dumas is one of the larger horizontal retort furnace plants in the United States. Here are produced Prime Western, Select, Brass Special and Intermediate grades of slab zinc for the galvanizing and brass industries. Roasting and sintering operations are also carried on at Dumas, making this plant an important factor in the widespread American Zinc picture.

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